

Figure 1A
Conventional architecture I

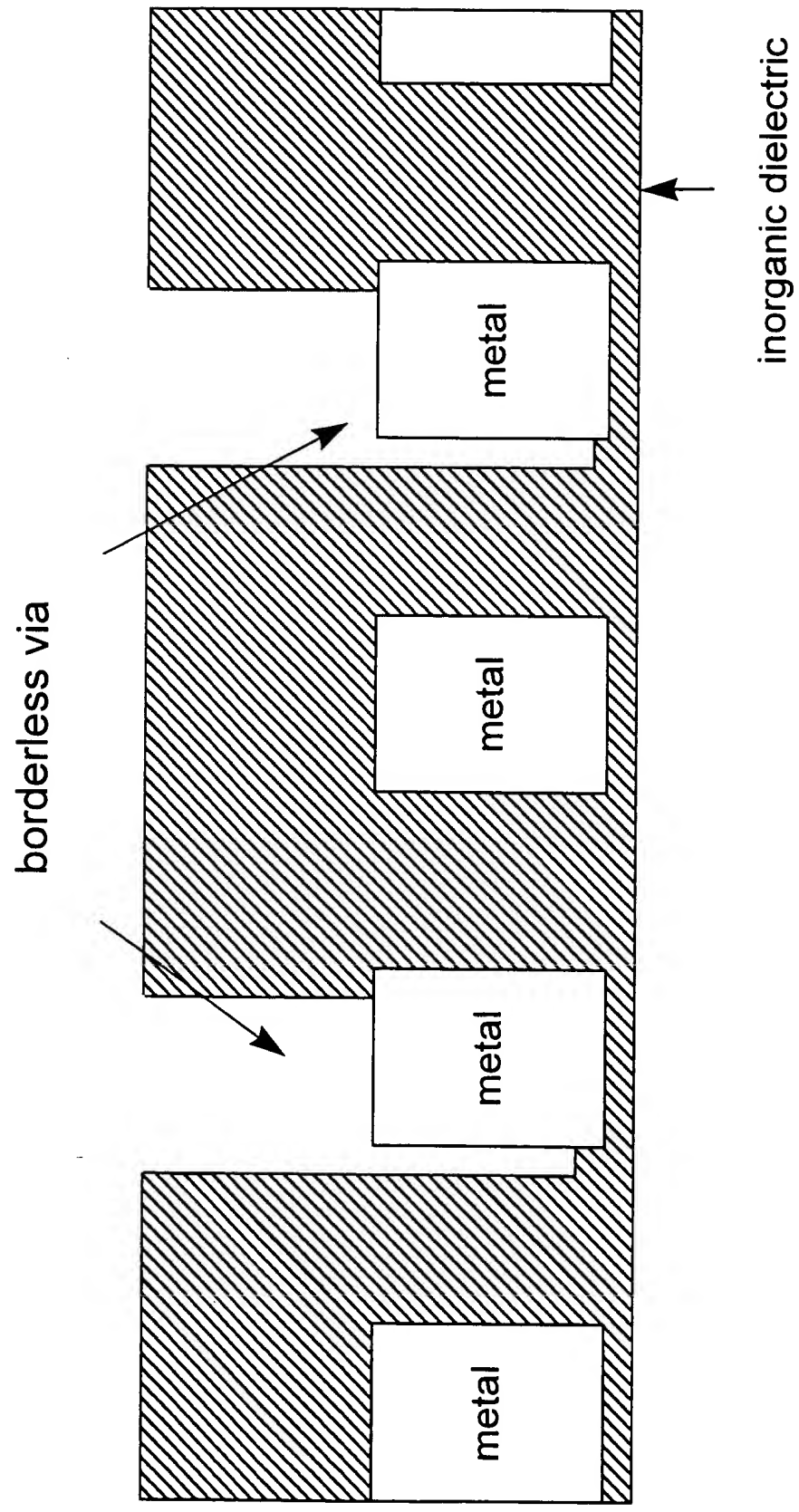


Figure 1B
Conventional architecture II

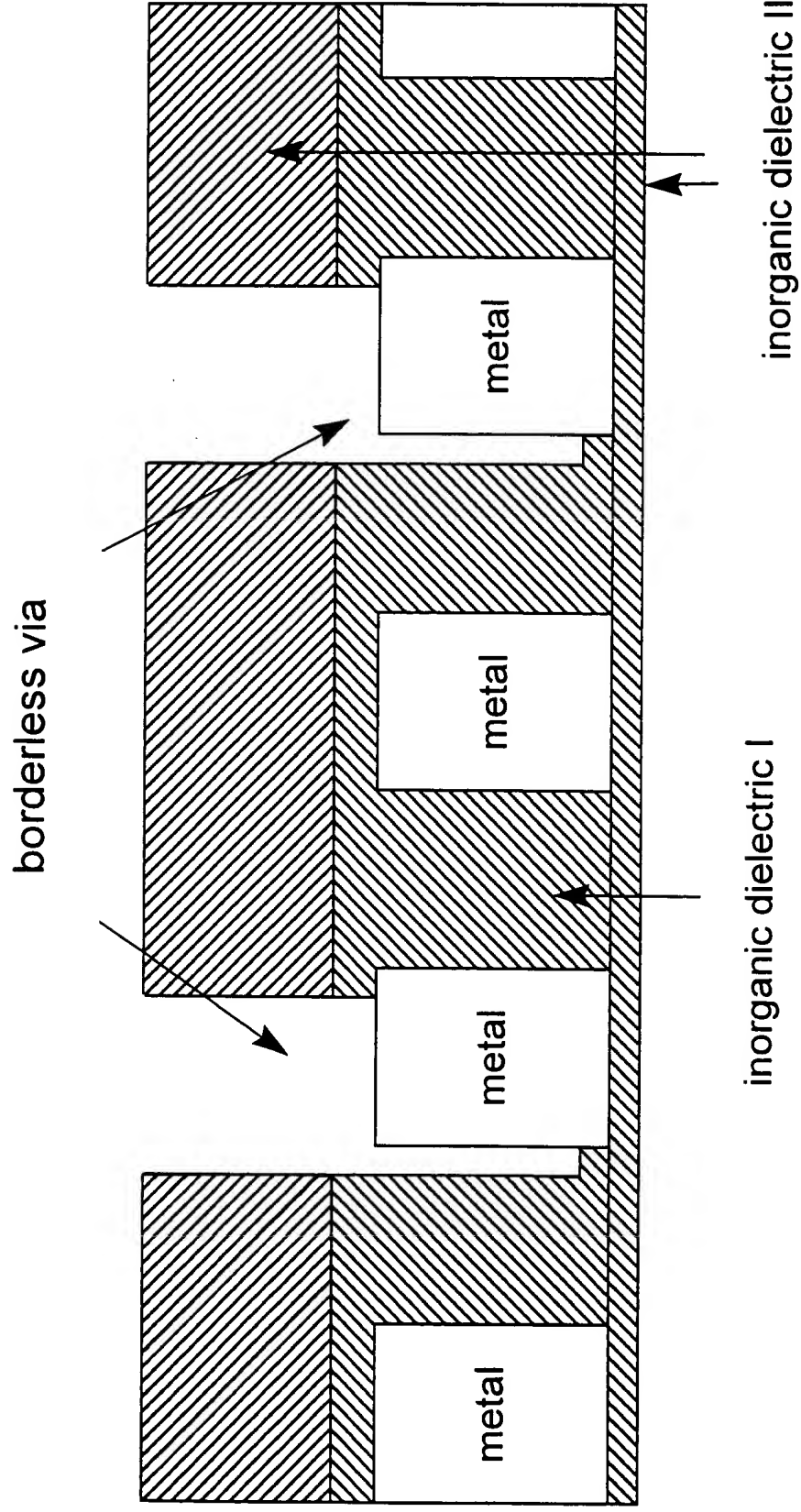


Figure 1C
Conventional architecture III

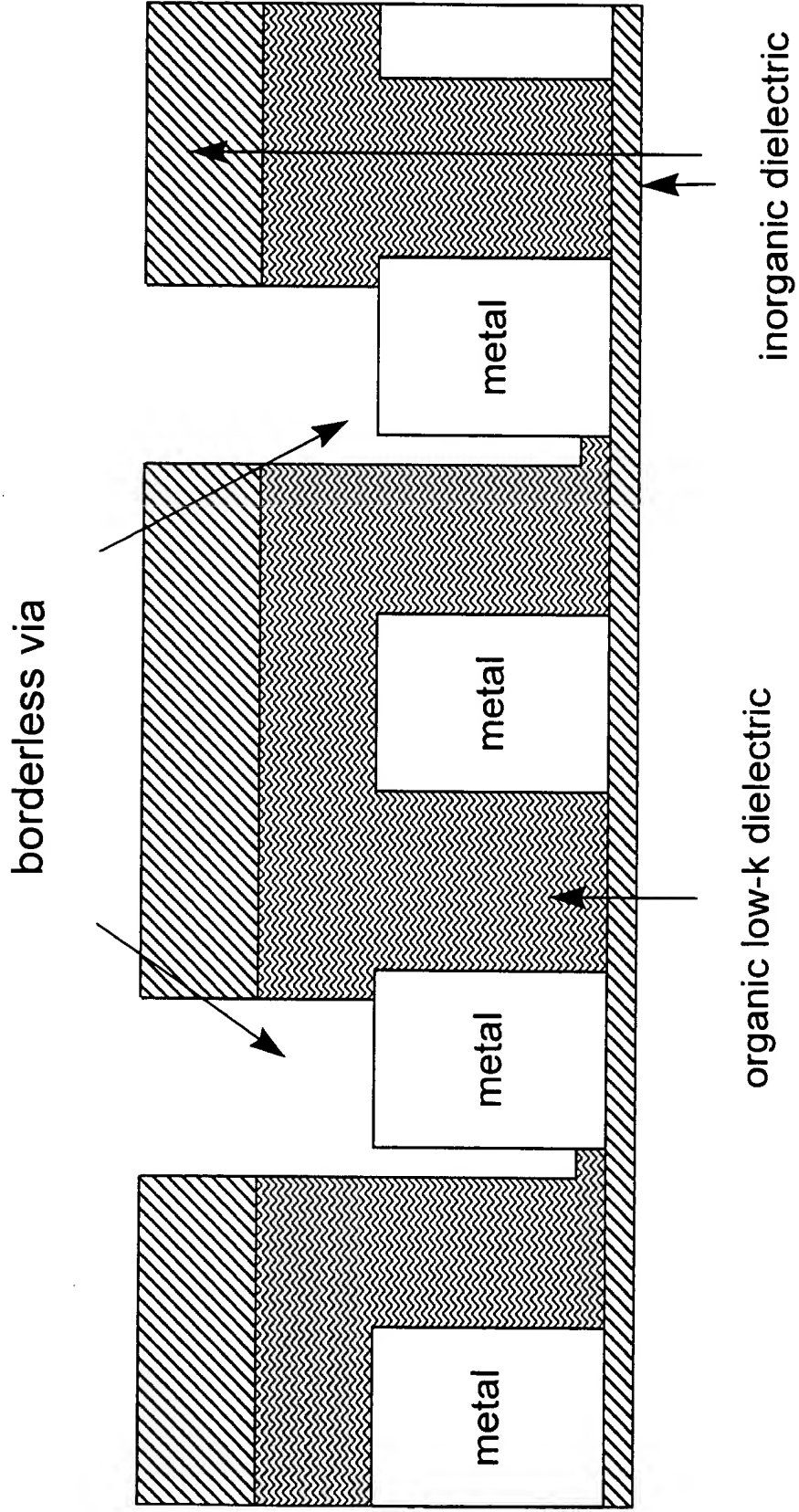


Figure 2A
Ideal architecture

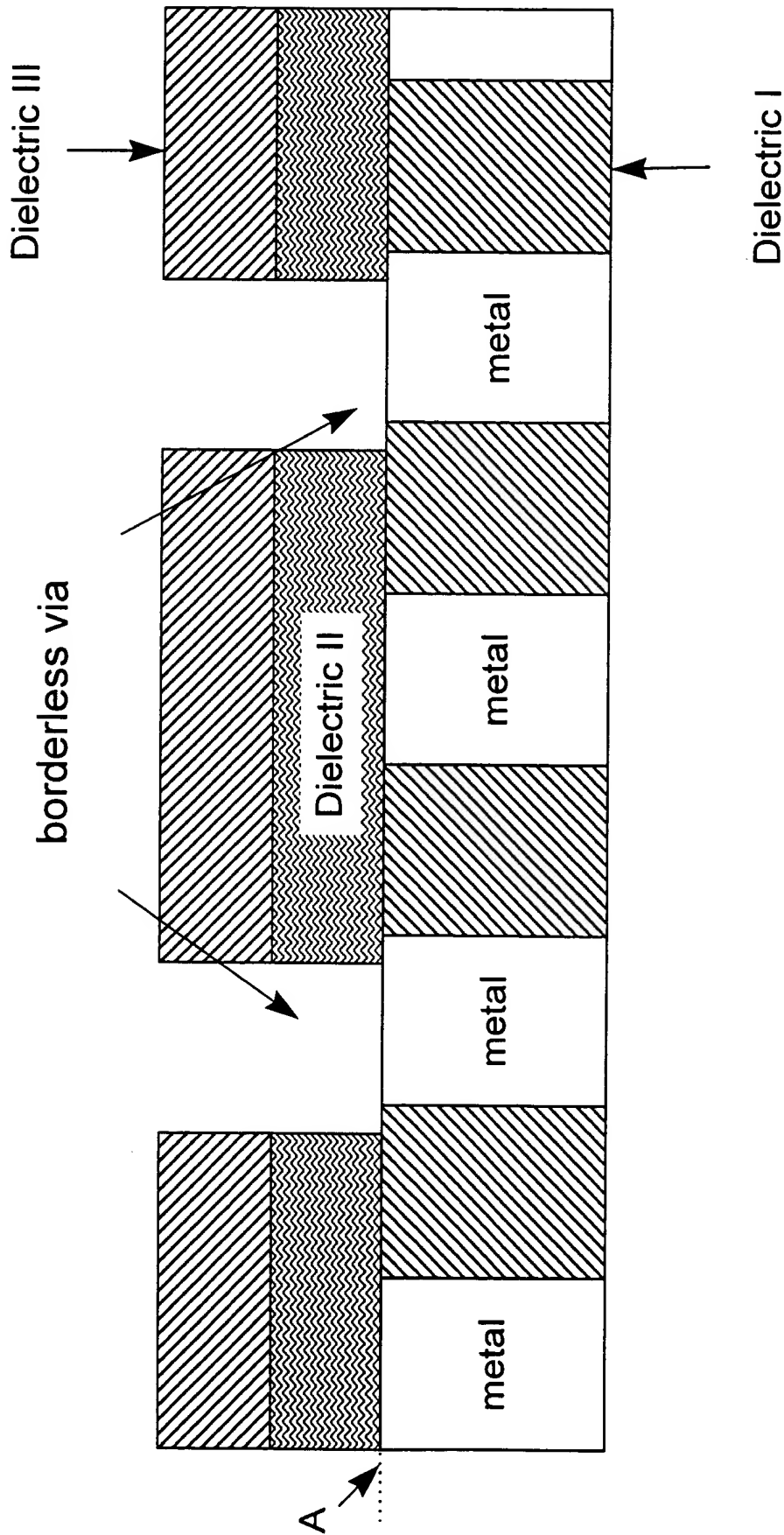


Figure 2B
Realistic architecture

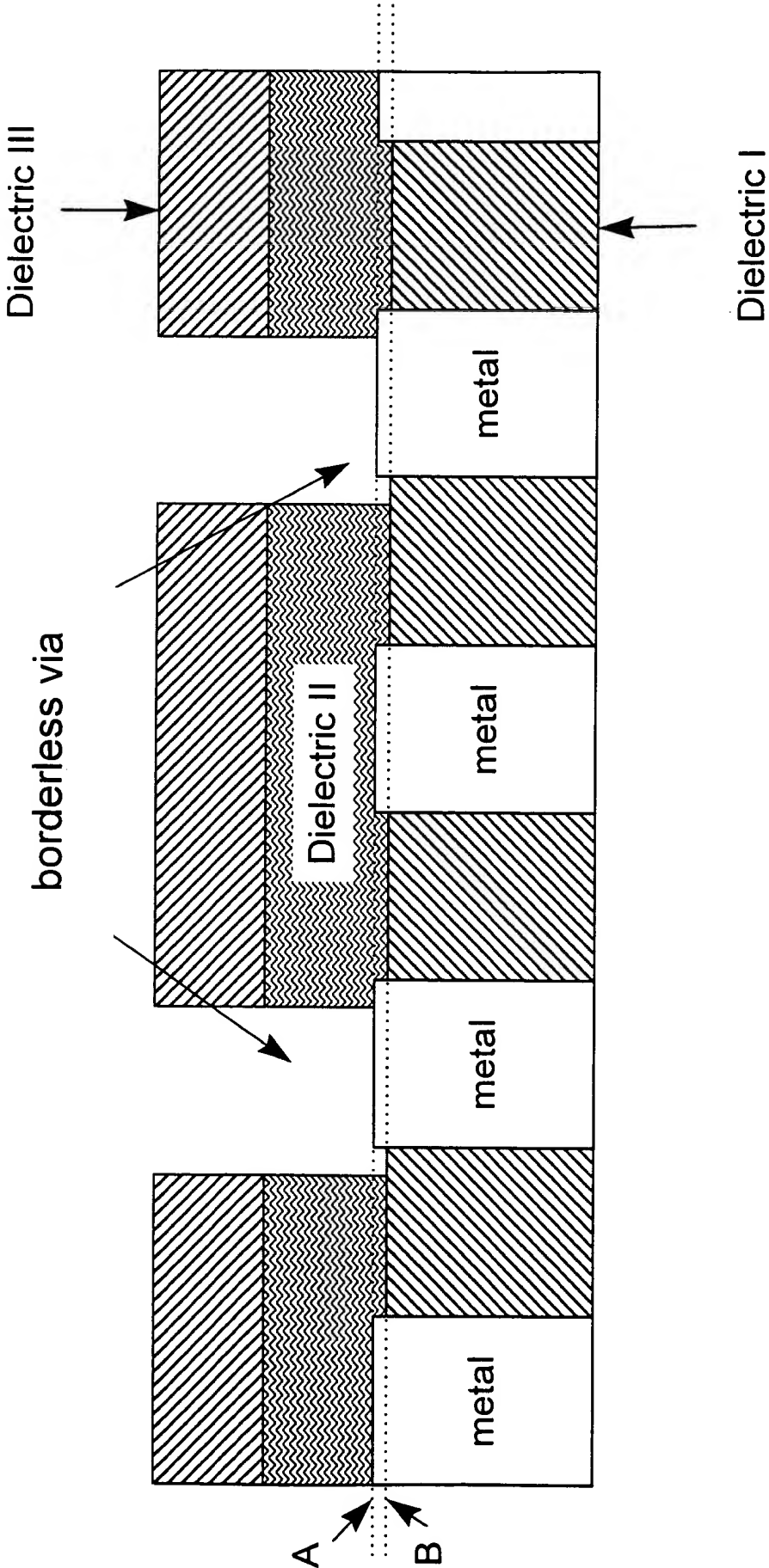


Figure 2C
New architecture I

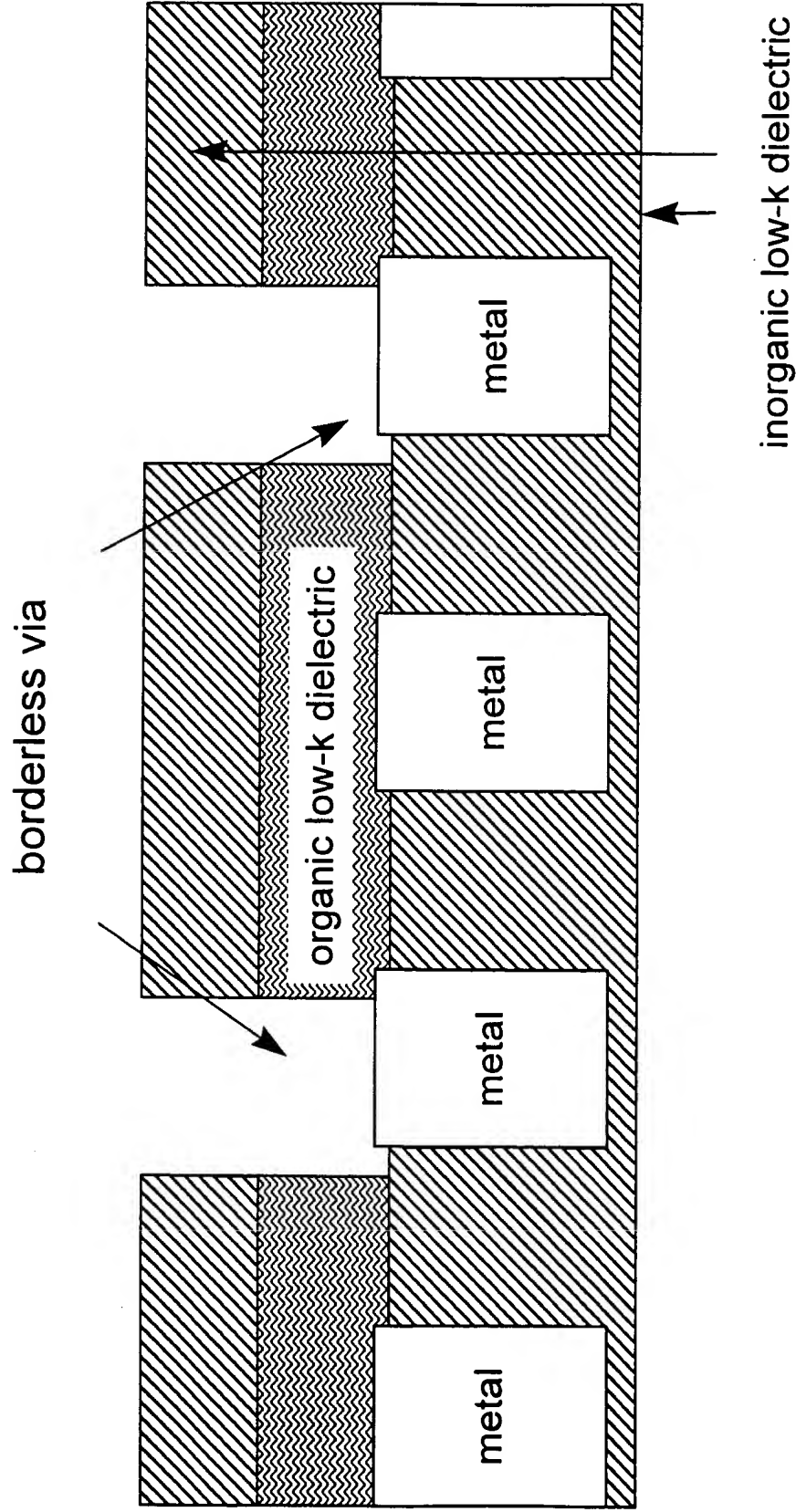


Figure 2D
New architecture II

borderless via

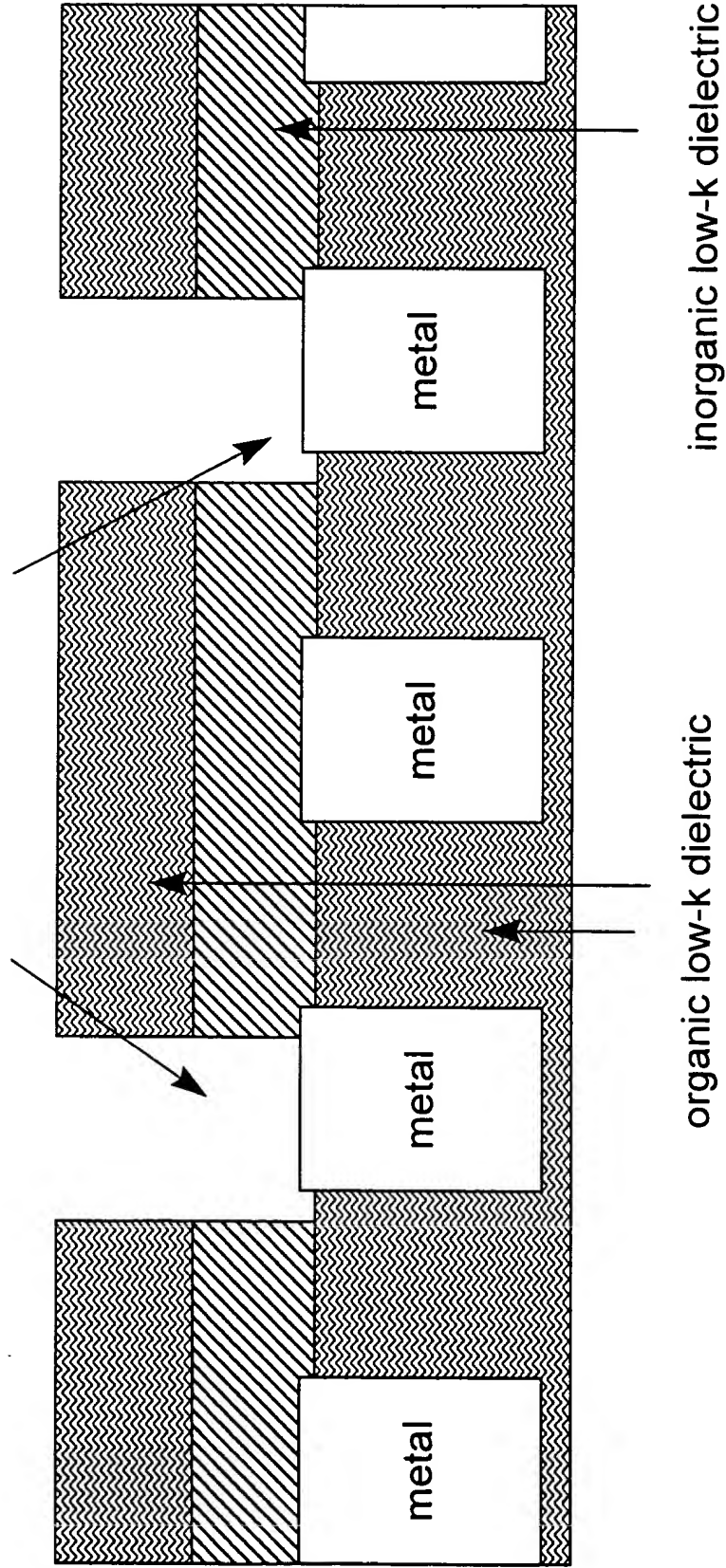


Figure 2E
New architecture III

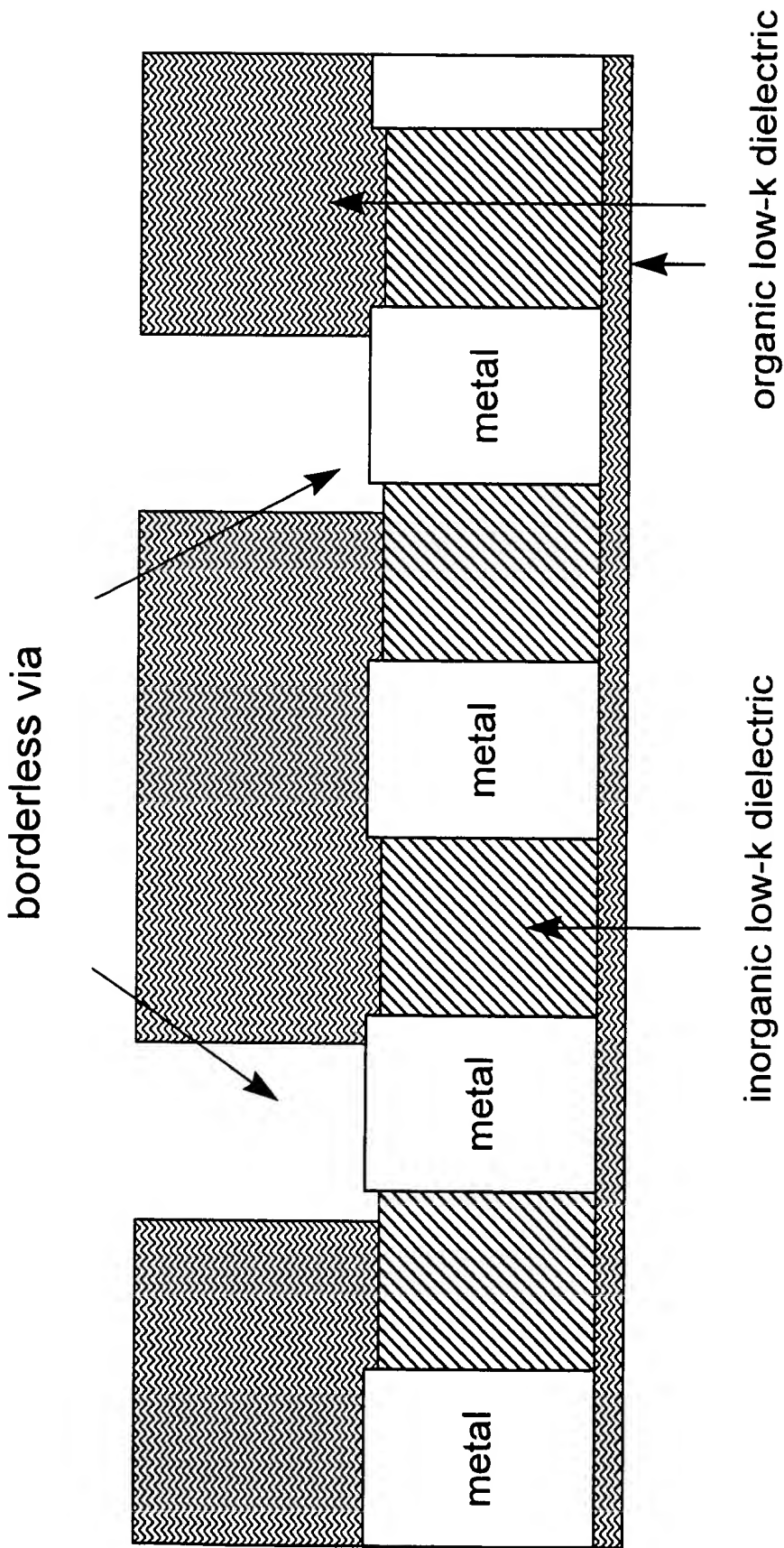


Figure 2F
New architecture IV

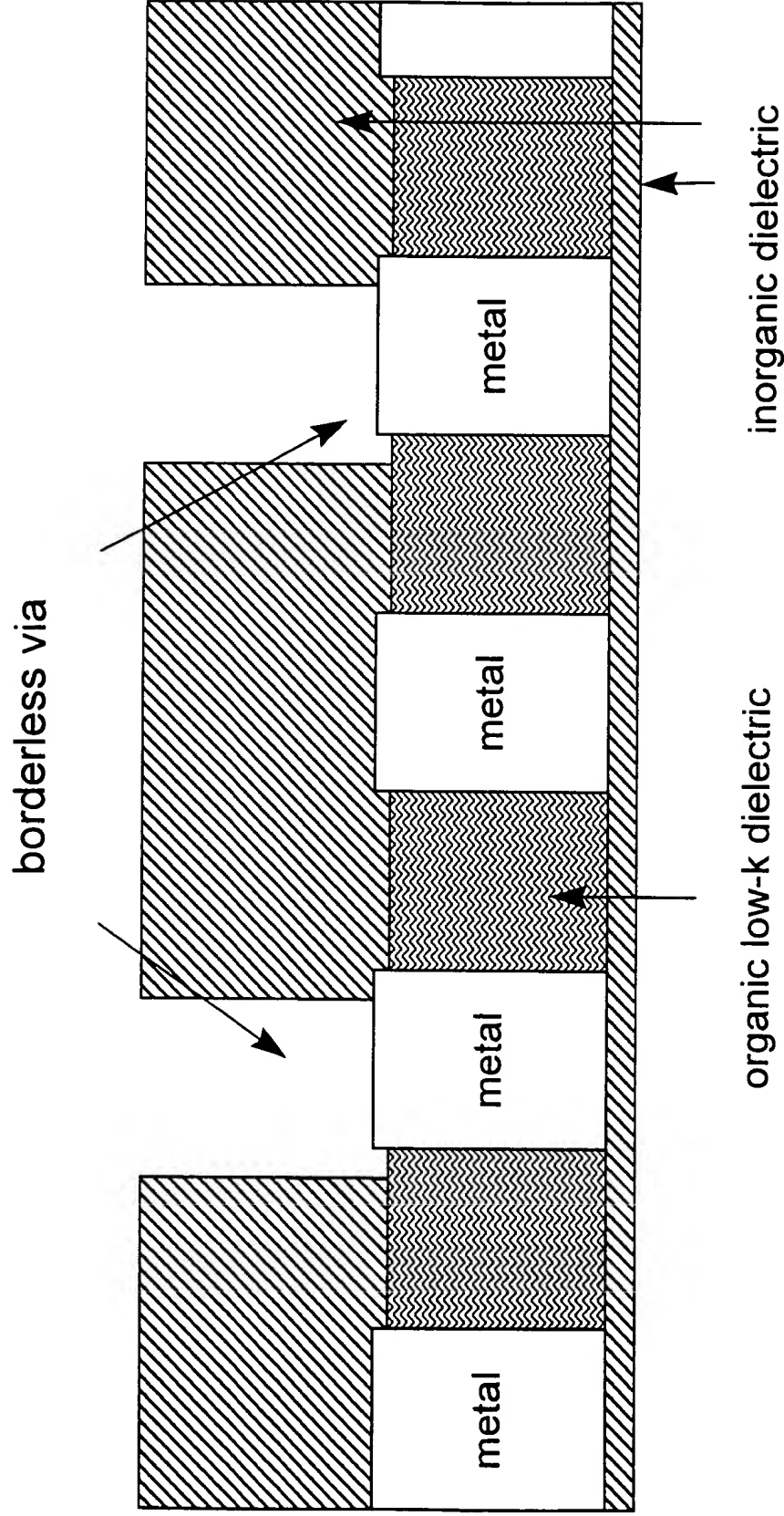


Figure 3A
After metal patterning

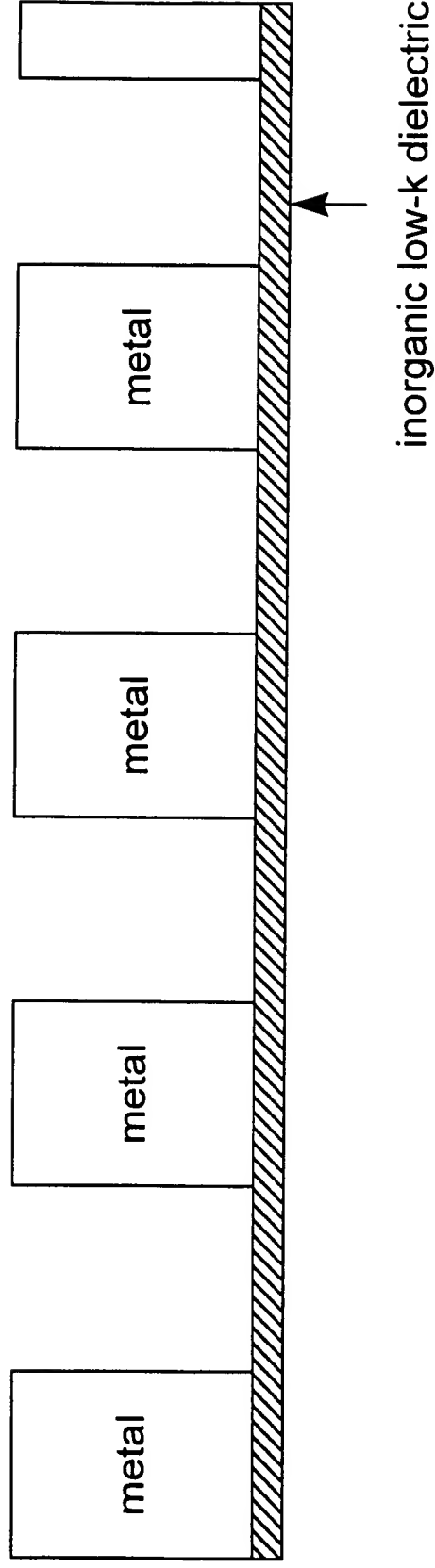


Figure 3B
Step 1: Inorganic low-k dielectric deposition

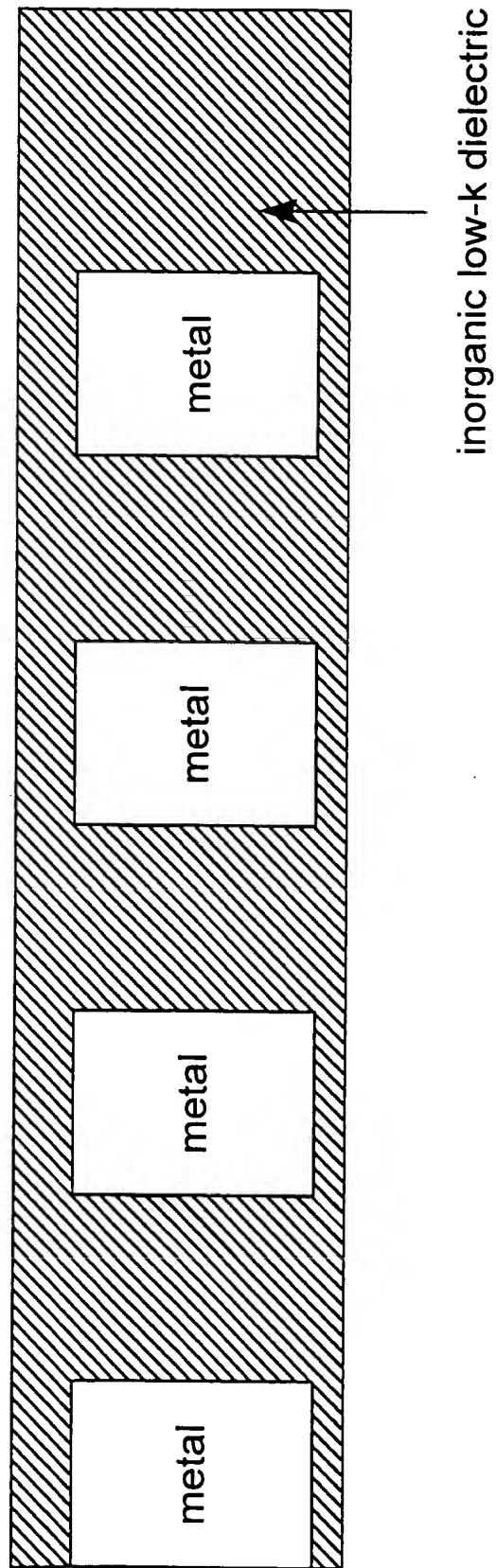


Figure 3C
Step 2: Inorganic low-k dielectric etchback

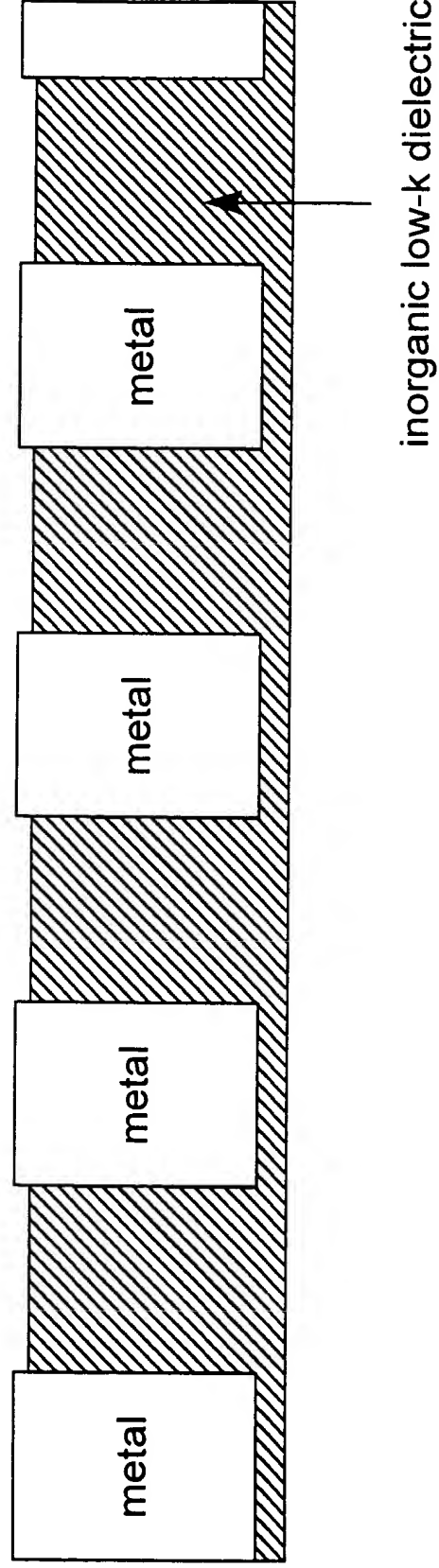


Figure 3D

Step 3: Organic low-k dielectric deposition

Step 4: Inorganic dielectric deposition

Step 5: Resist spin and bake

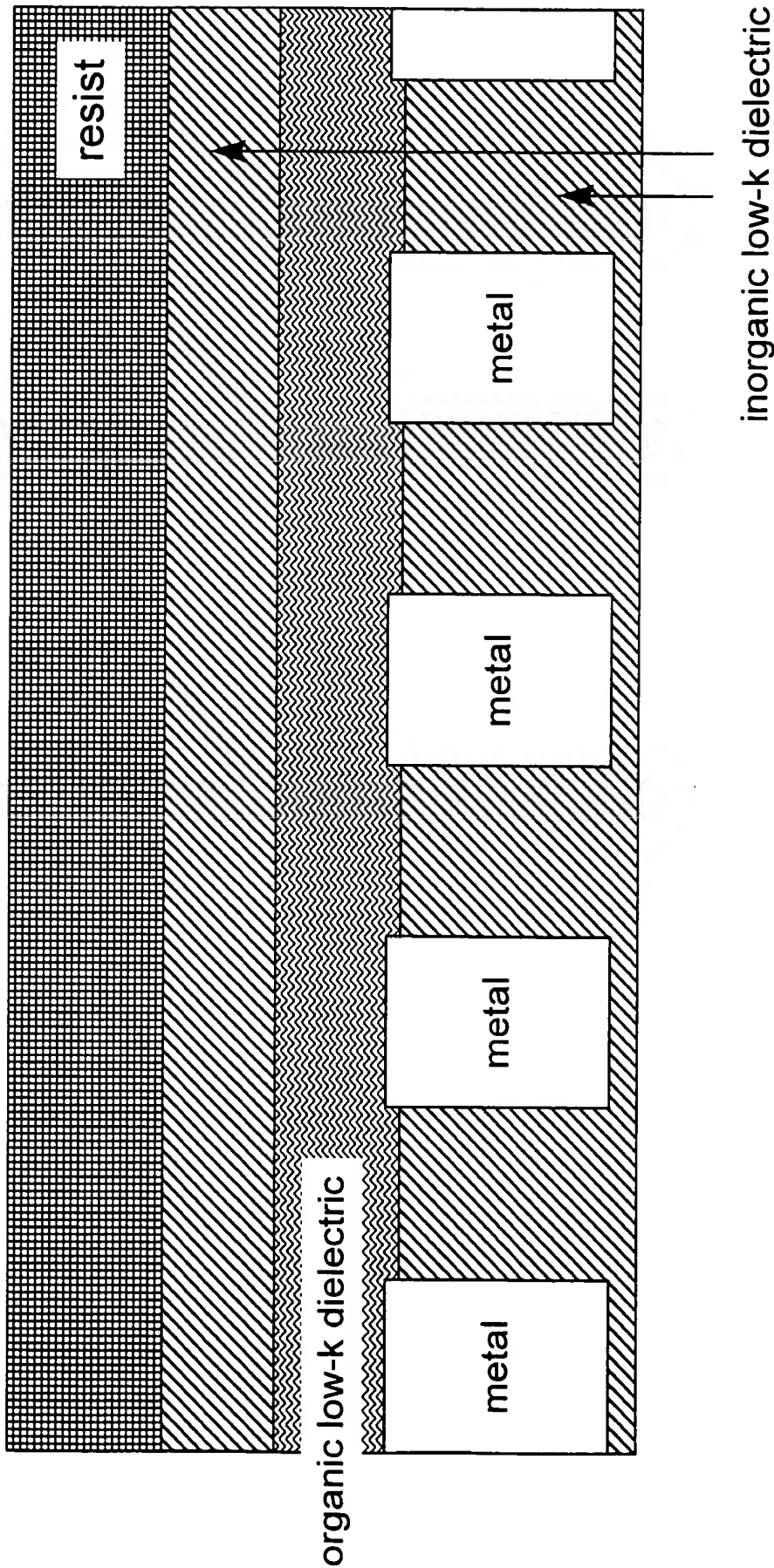


Figure 3E

Step 6: Via mask and resist development

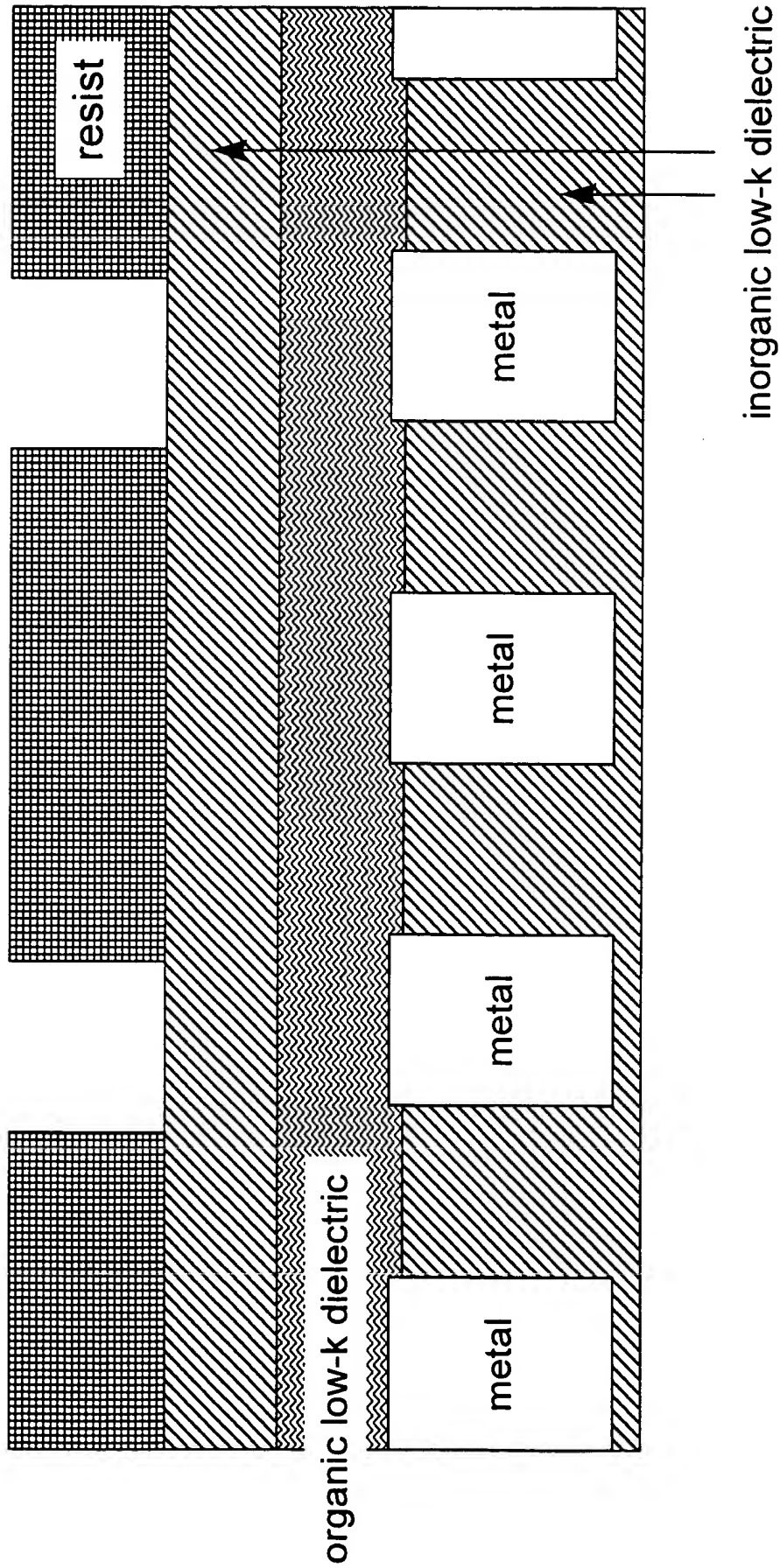


Figure 3F
Step 7: Anisotropic inorganic low-k dielectric etch

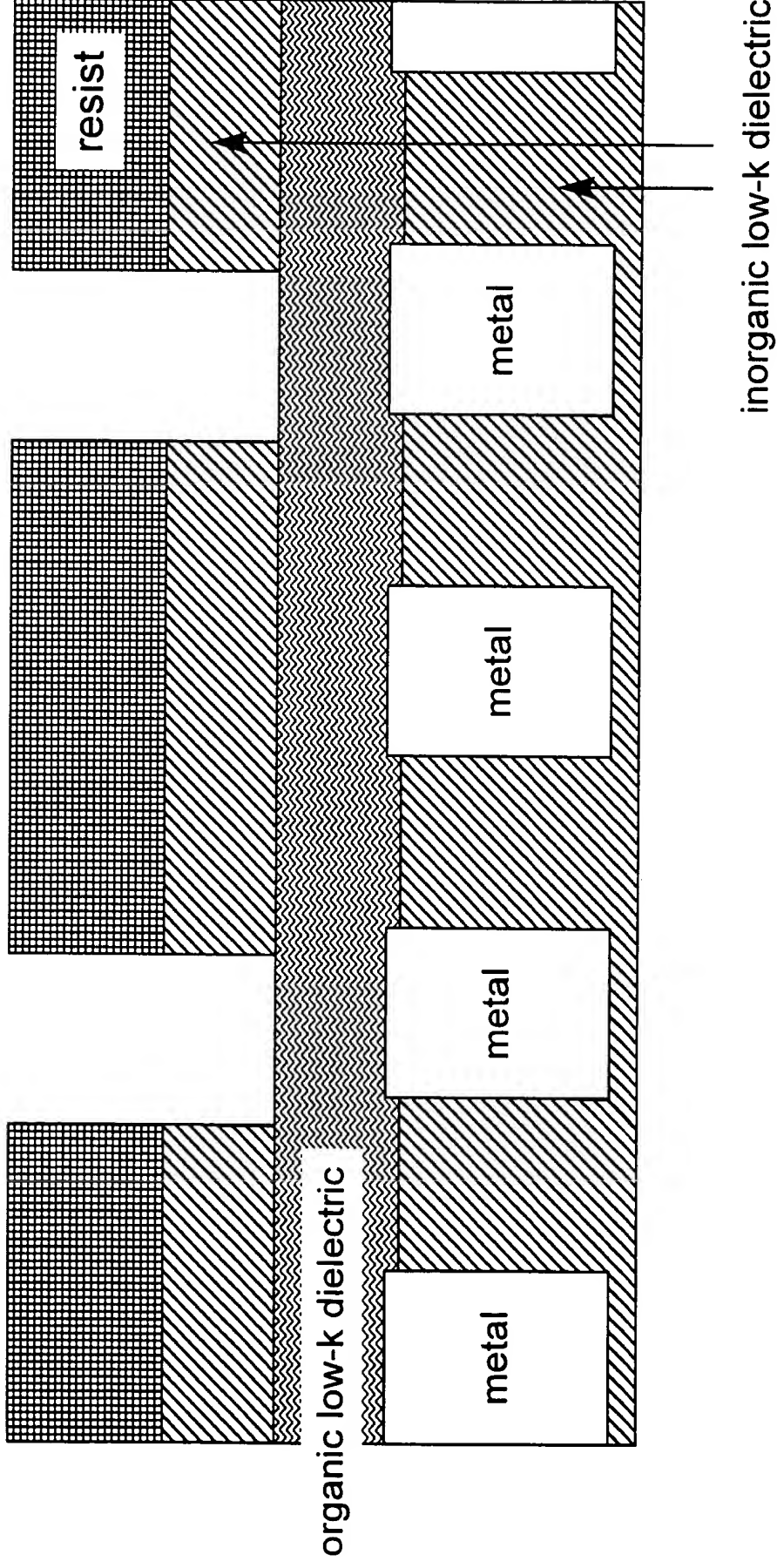


Figure 3G
Step 8: Anisotropic organic low-k dielectric etch

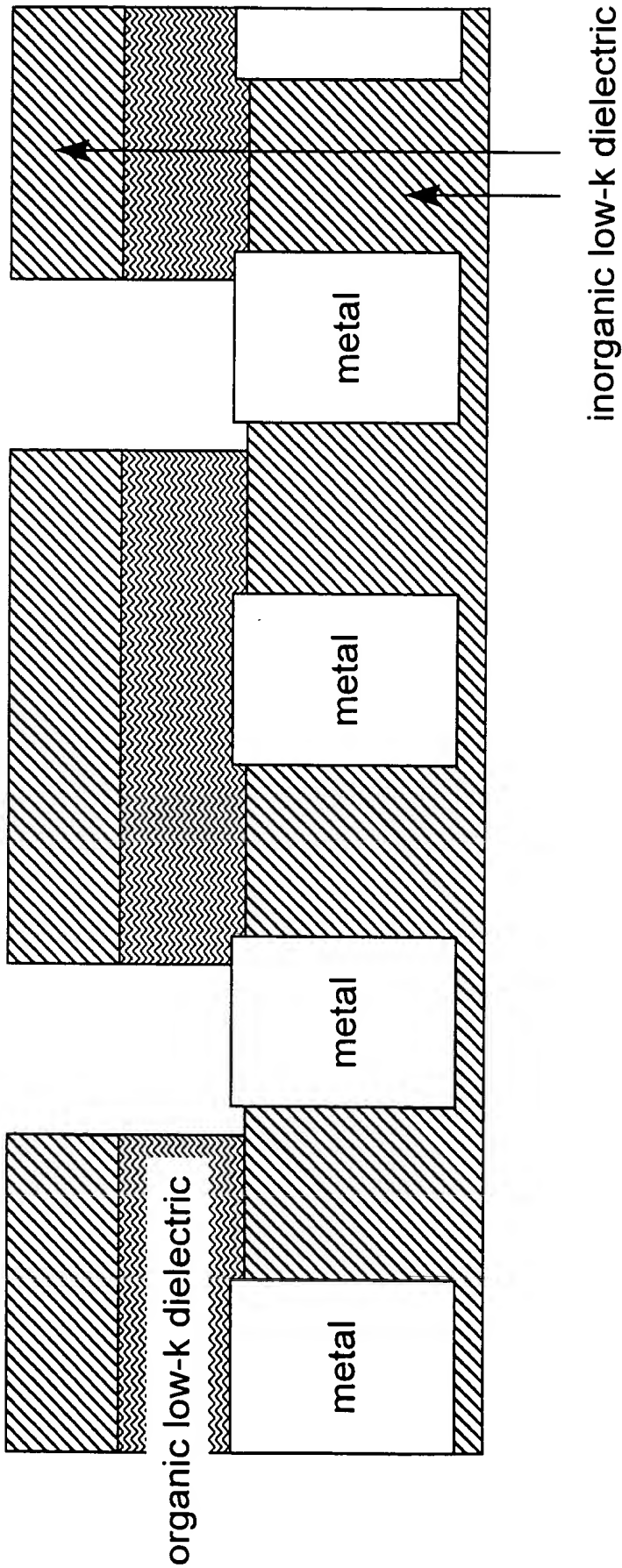


Figure 4A
After metal patterning

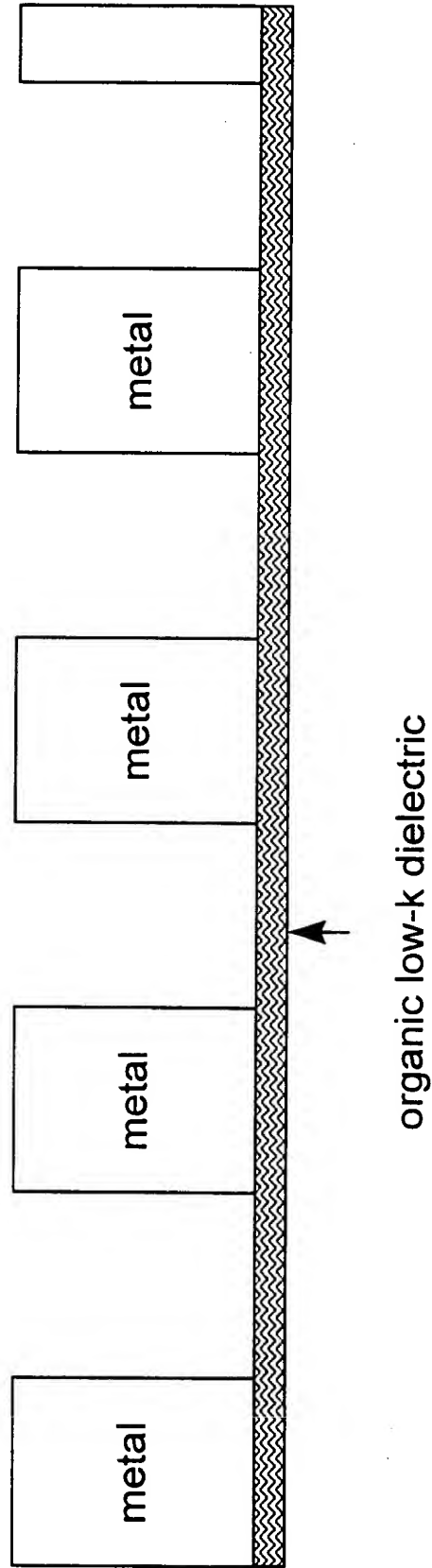


Figure 4B
Step 1: Organic low-k dielectric deposition

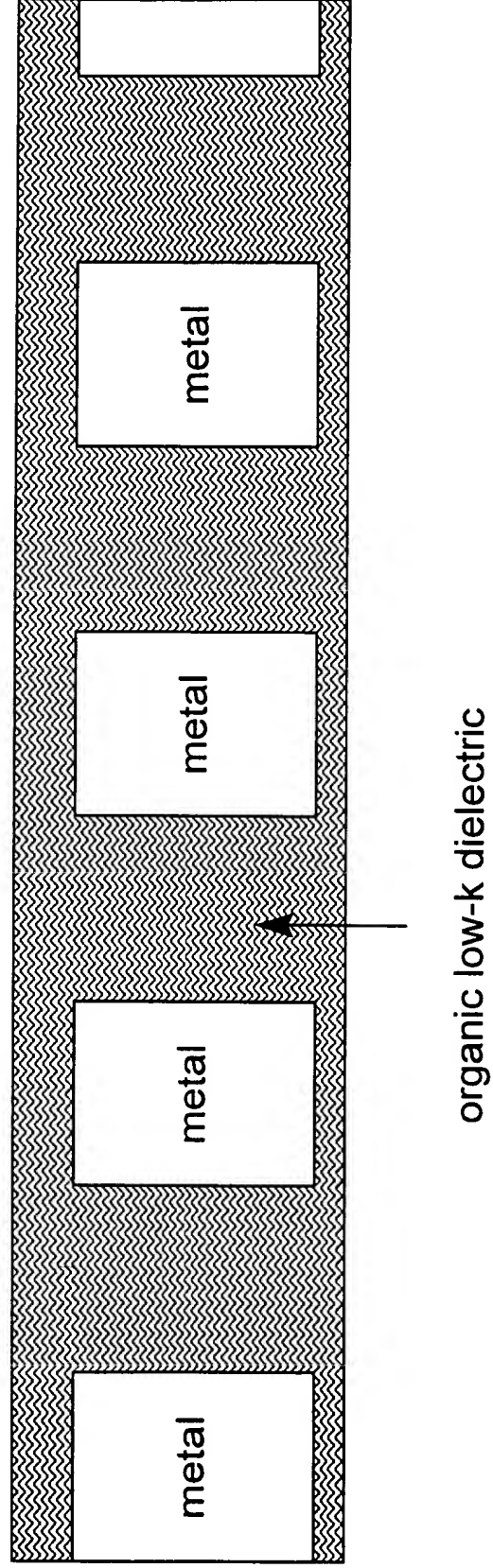


Figure 4C
Step 2: Organic low-k dielectric etchback

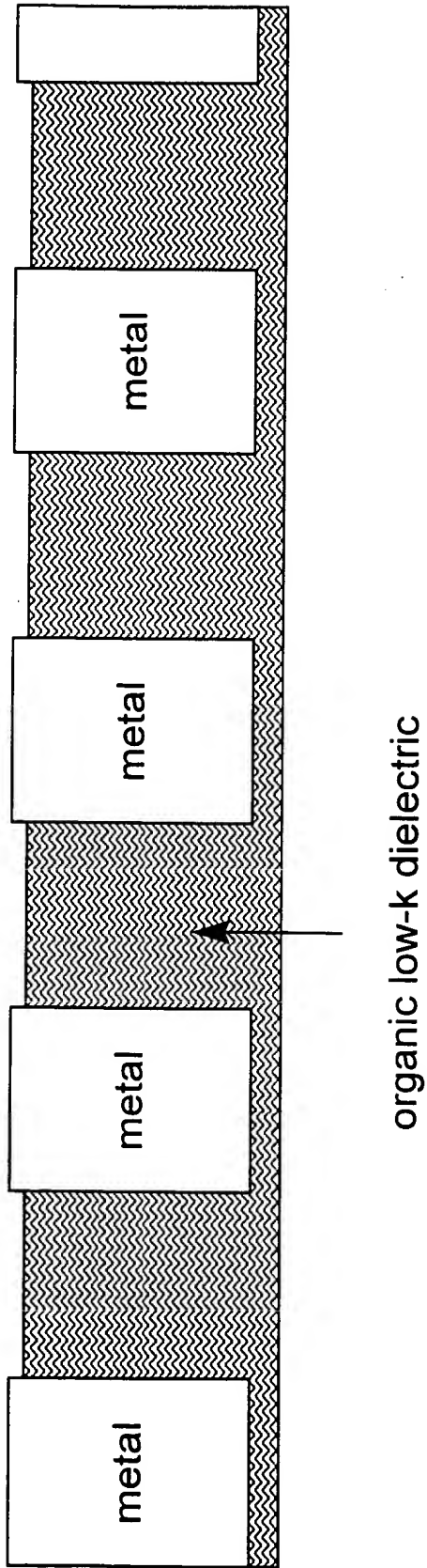


Figure 4D

Step 3: Inorganic low-k dielectric deposition

Step 4: Organic low-k dielectric deposition.

Step 5: Inorganic low-k dielectric deposition.

Step 6: Resist spin and bake

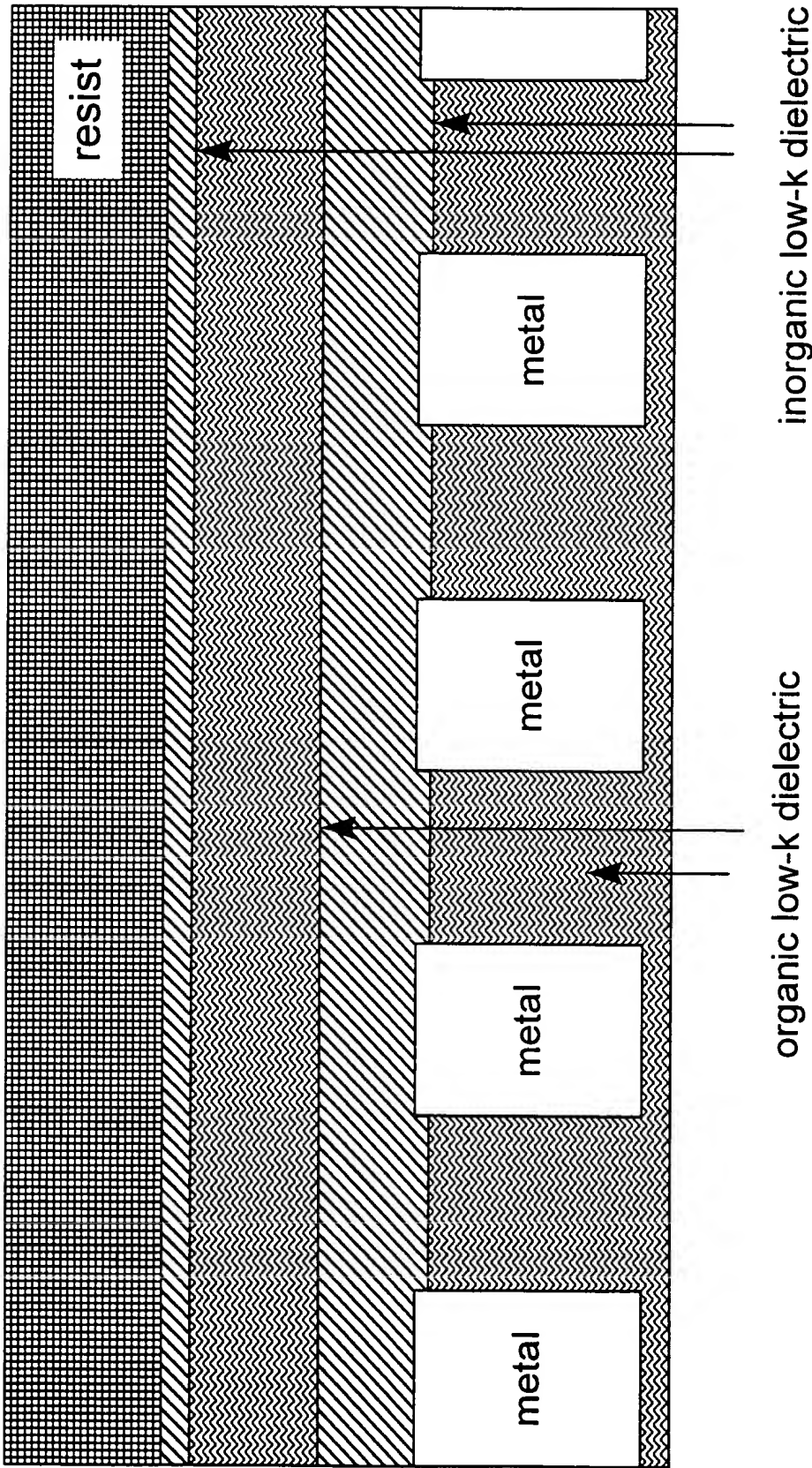


Figure 4E

Step 7: Via mask and resist development

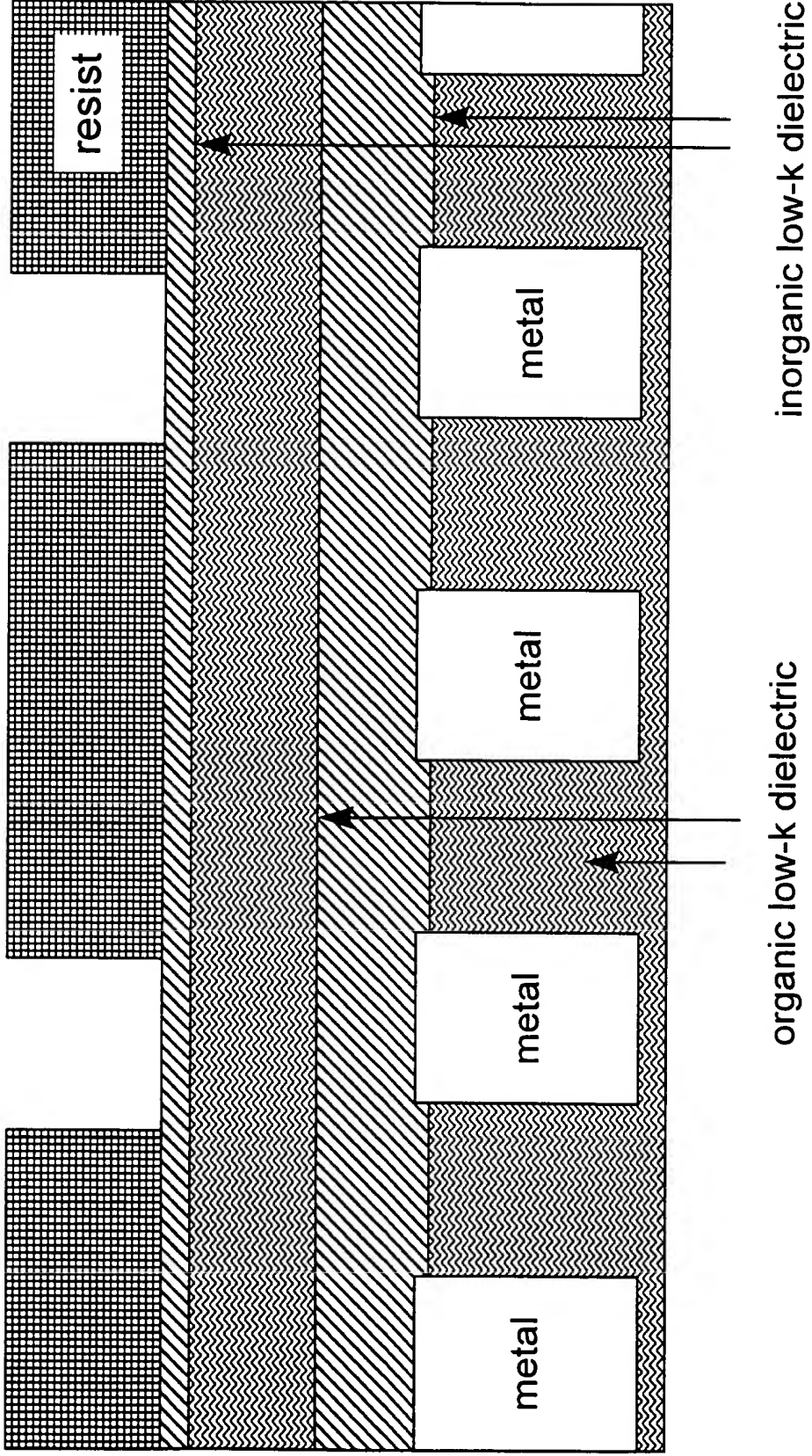


Figure 4F

Step 8: Anisotropic inorganic dielectric etch

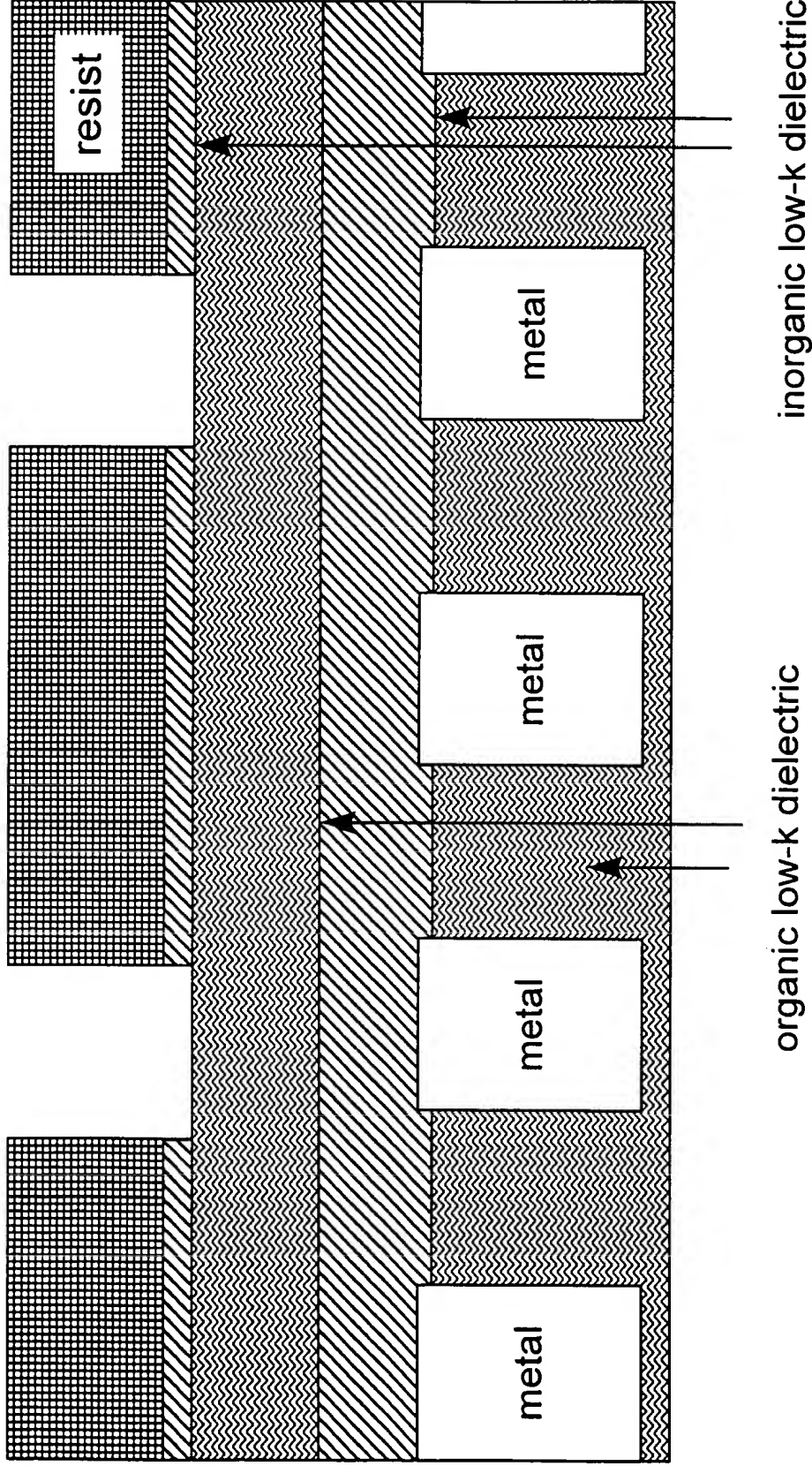


Figure 4G
Step 9: Anisotropic organic low-k dielectric etch

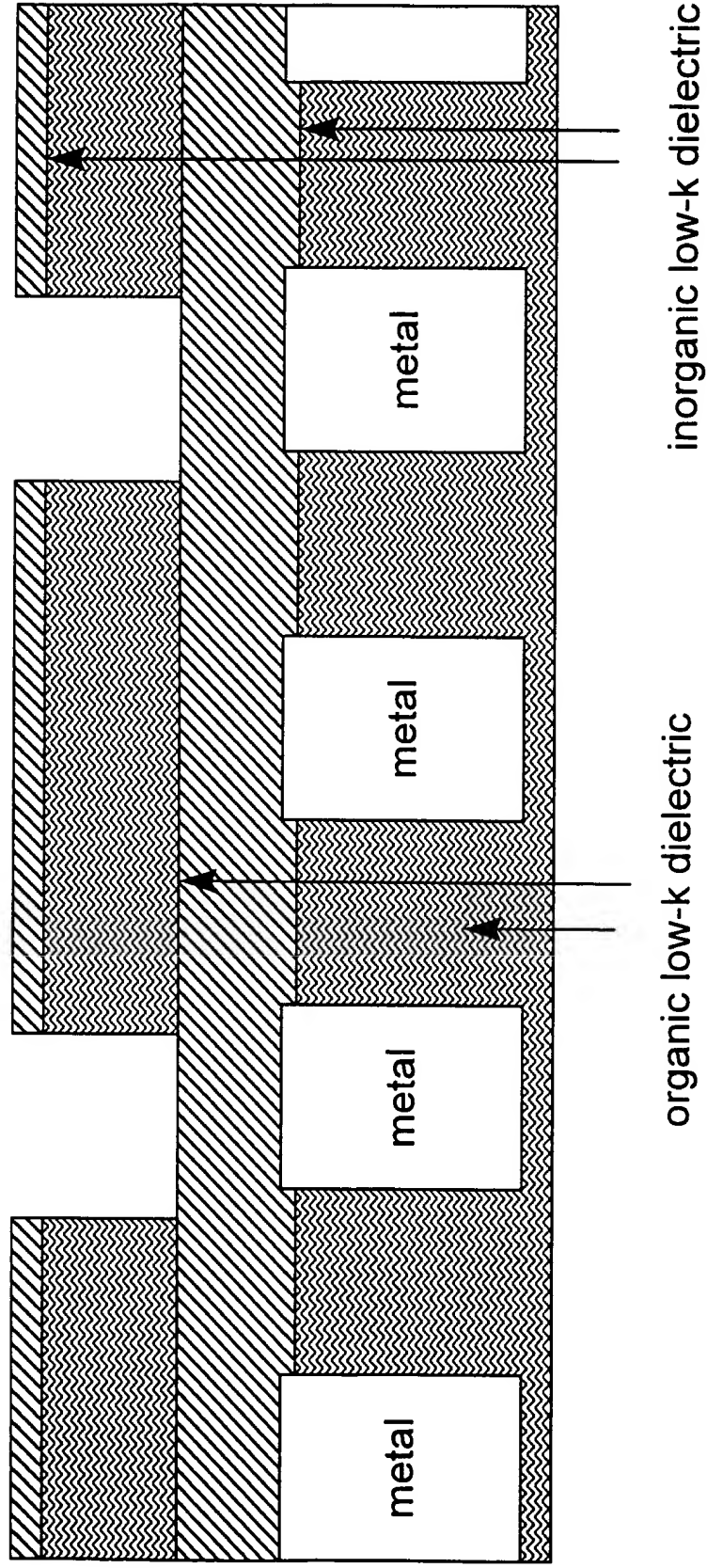


Figure 4H
Step 10: Anisotropic organic low-k dielectric etch

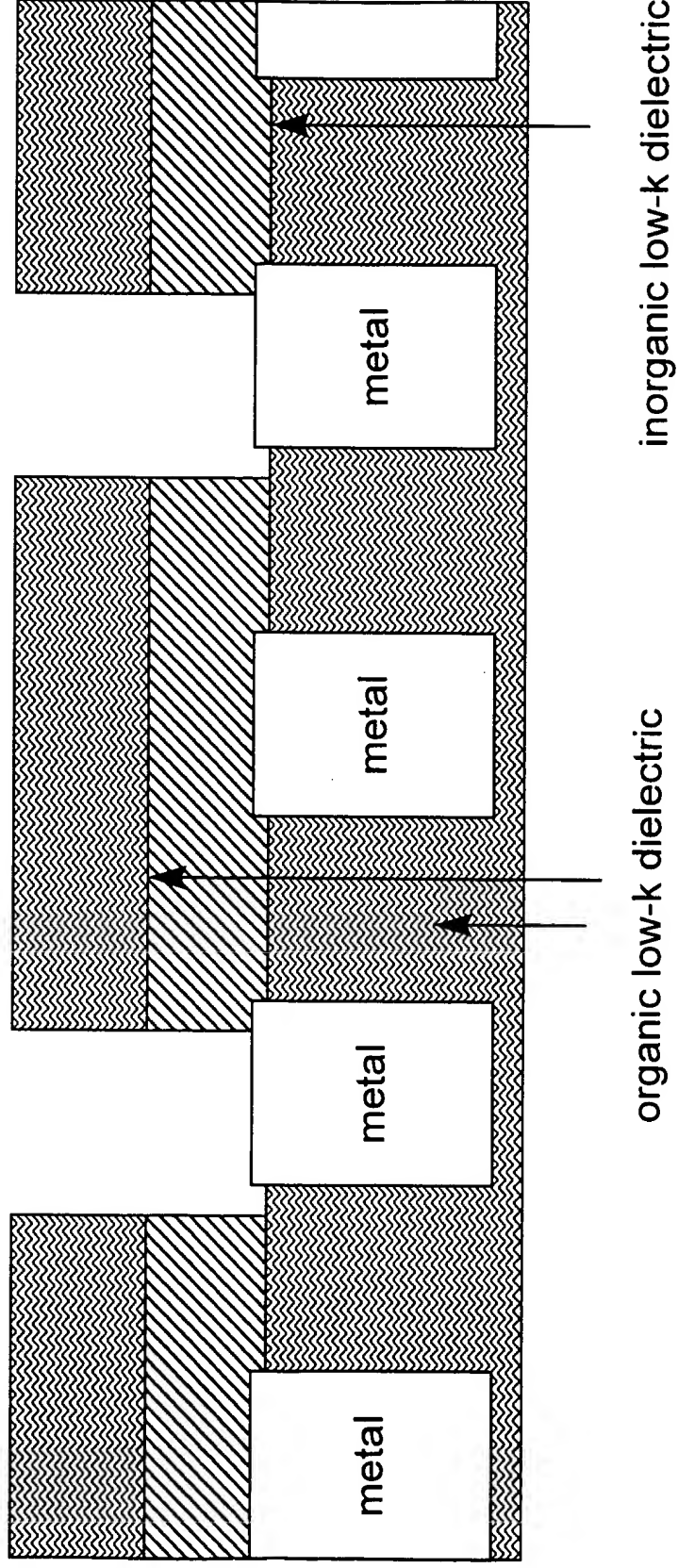


Figure 5A

Step 3: Organic low-k dielectric deposition

Step 4: Sacrificial metal deposition

Step 5: Resist spin and bake

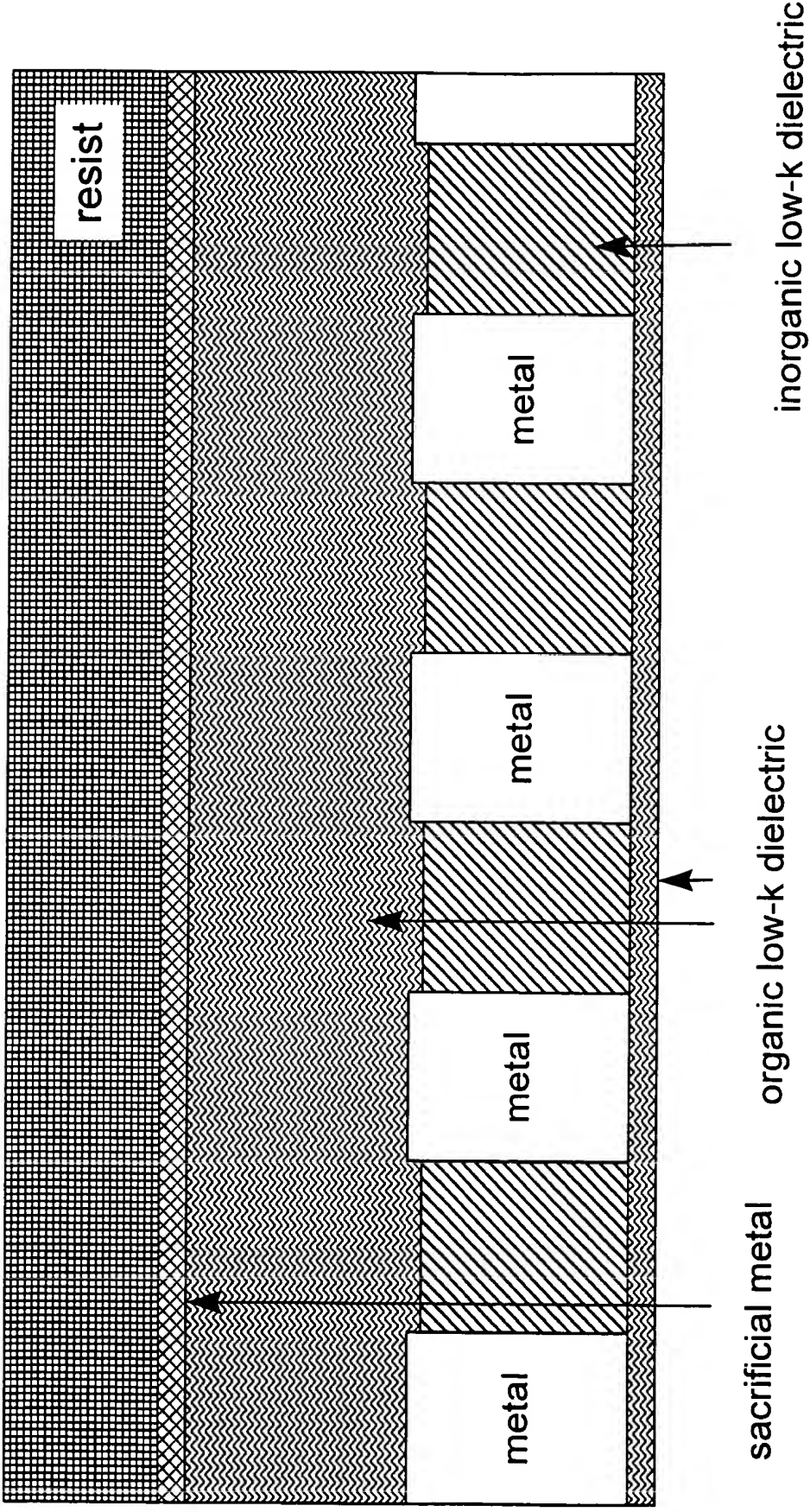


Figure 5B

Step 6: Via mask and resist development

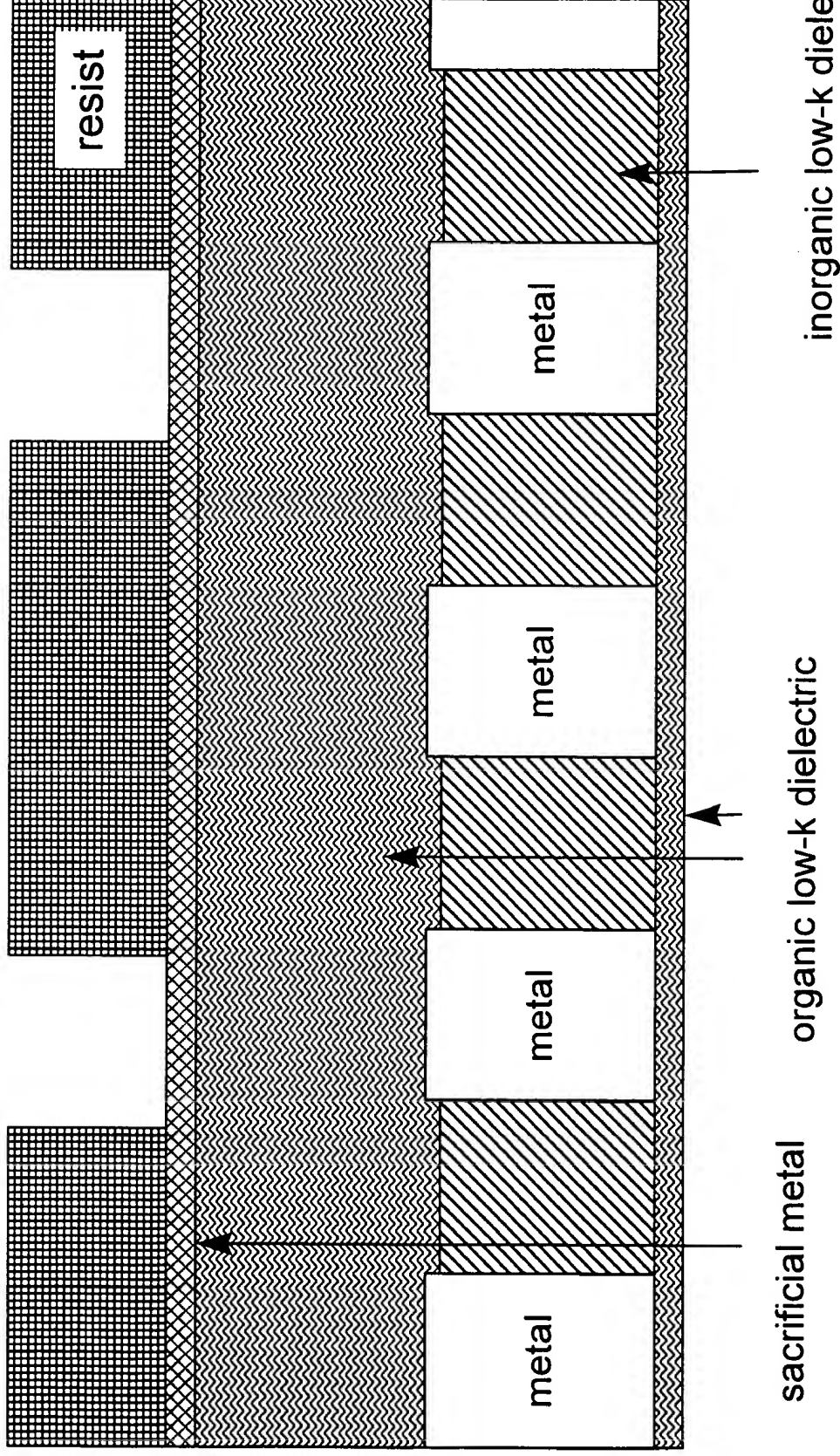


Figure 5C

Step 7: Anisotropic sacrificial metal etch

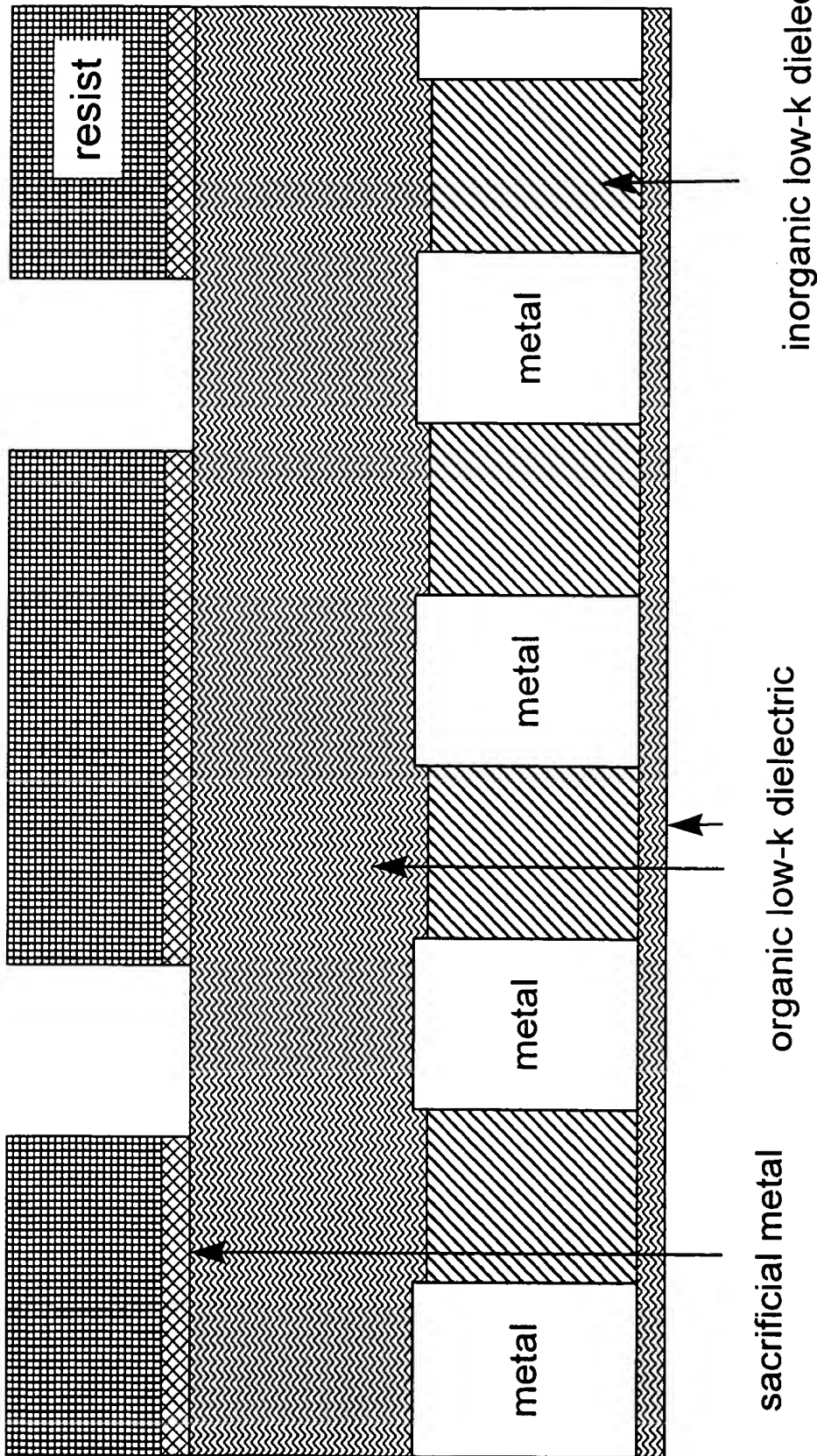


Figure 5D
Step 8: Anisotropic organic low-k dielectric etch

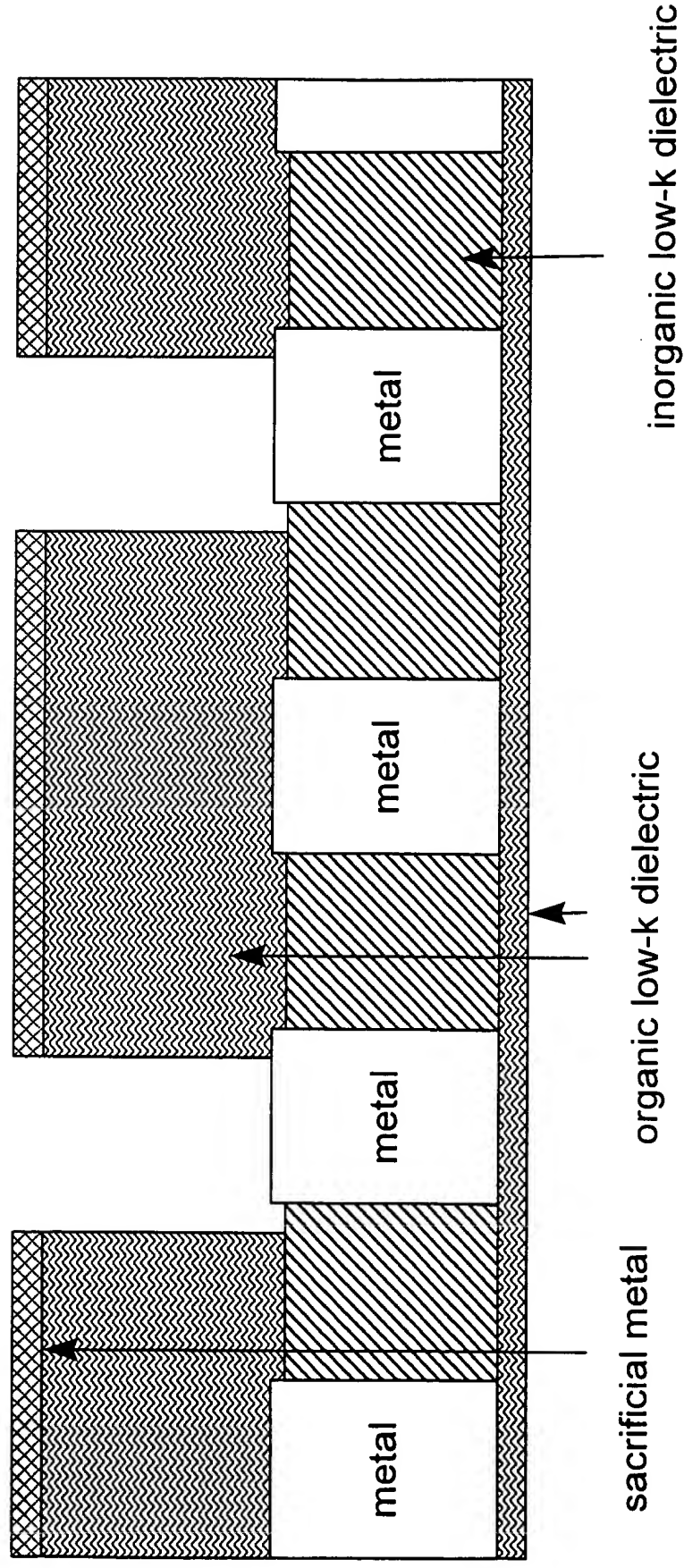
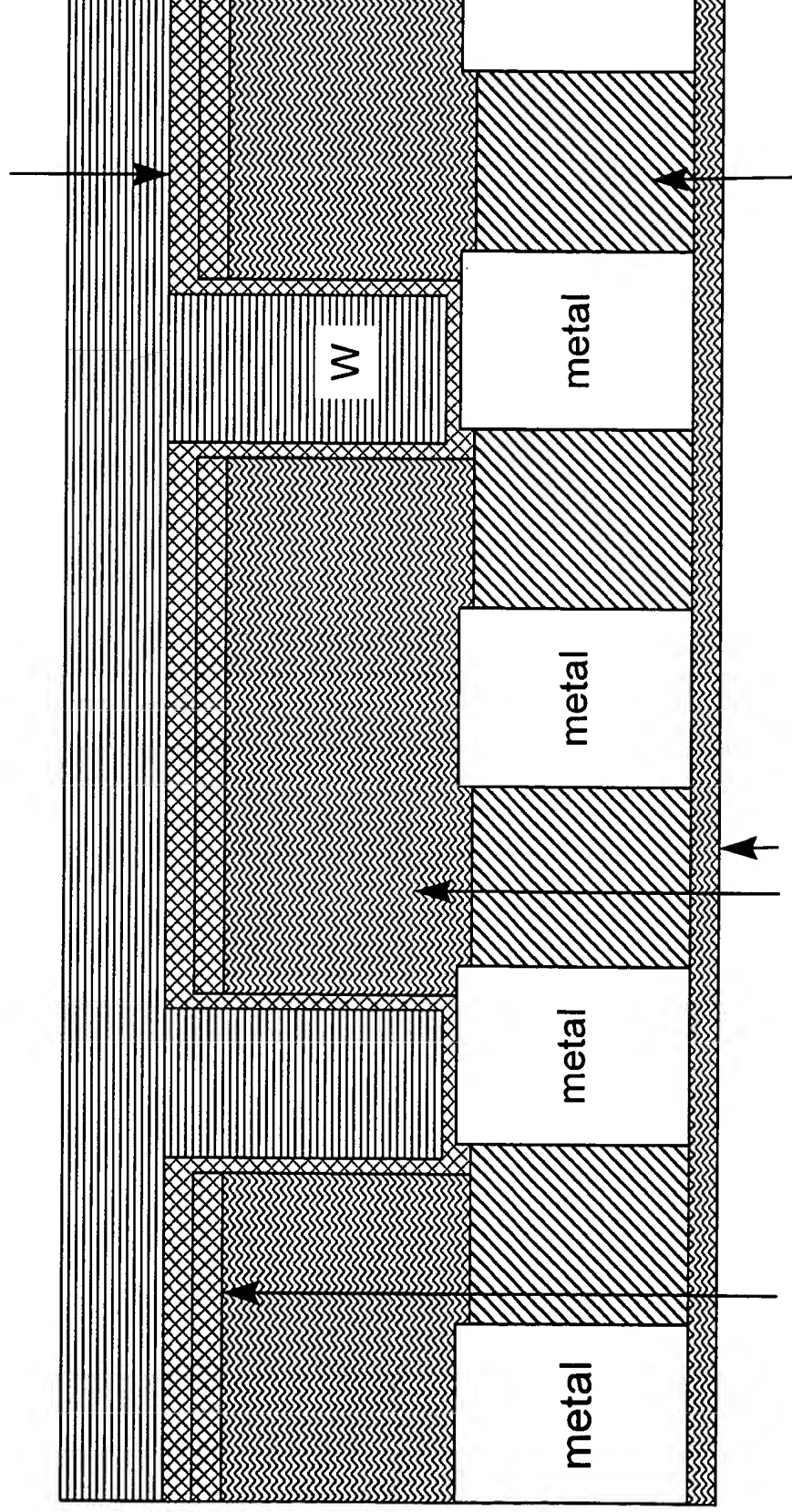


Figure 5E

Step 9: Barrier metal and W depositions

barrier metal



sacrificial metal

organic low-k dielectric

inorganic low-k dielectric

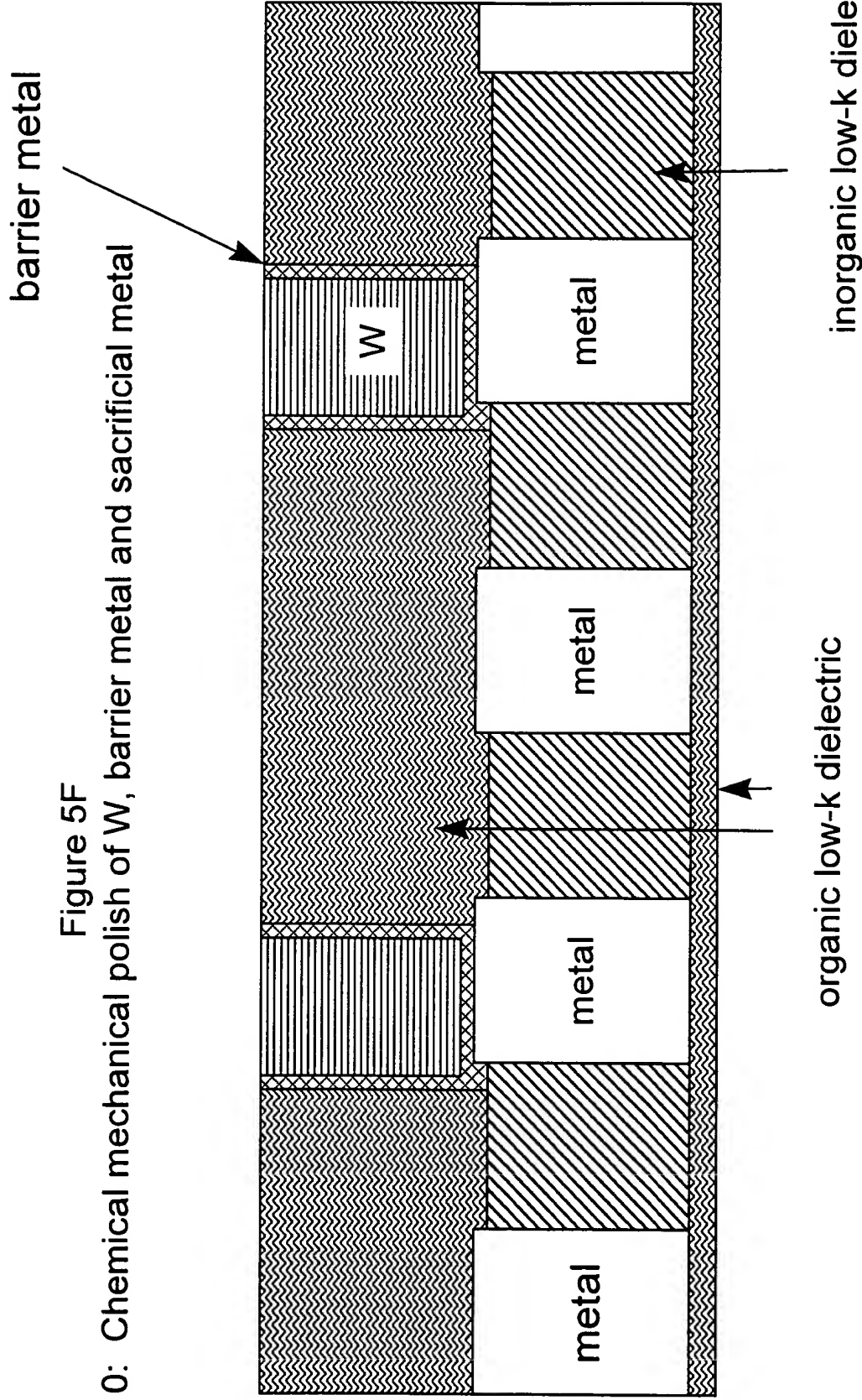


Figure 5F

Step 10: Chemical mechanical polish of W, barrier metal and sacrificial metal

Figure 6A

Step 3: Inorganic low-k dielectric deposition

Step 4: Sacrificial metal deposition

Step 5: Resist spin and bake

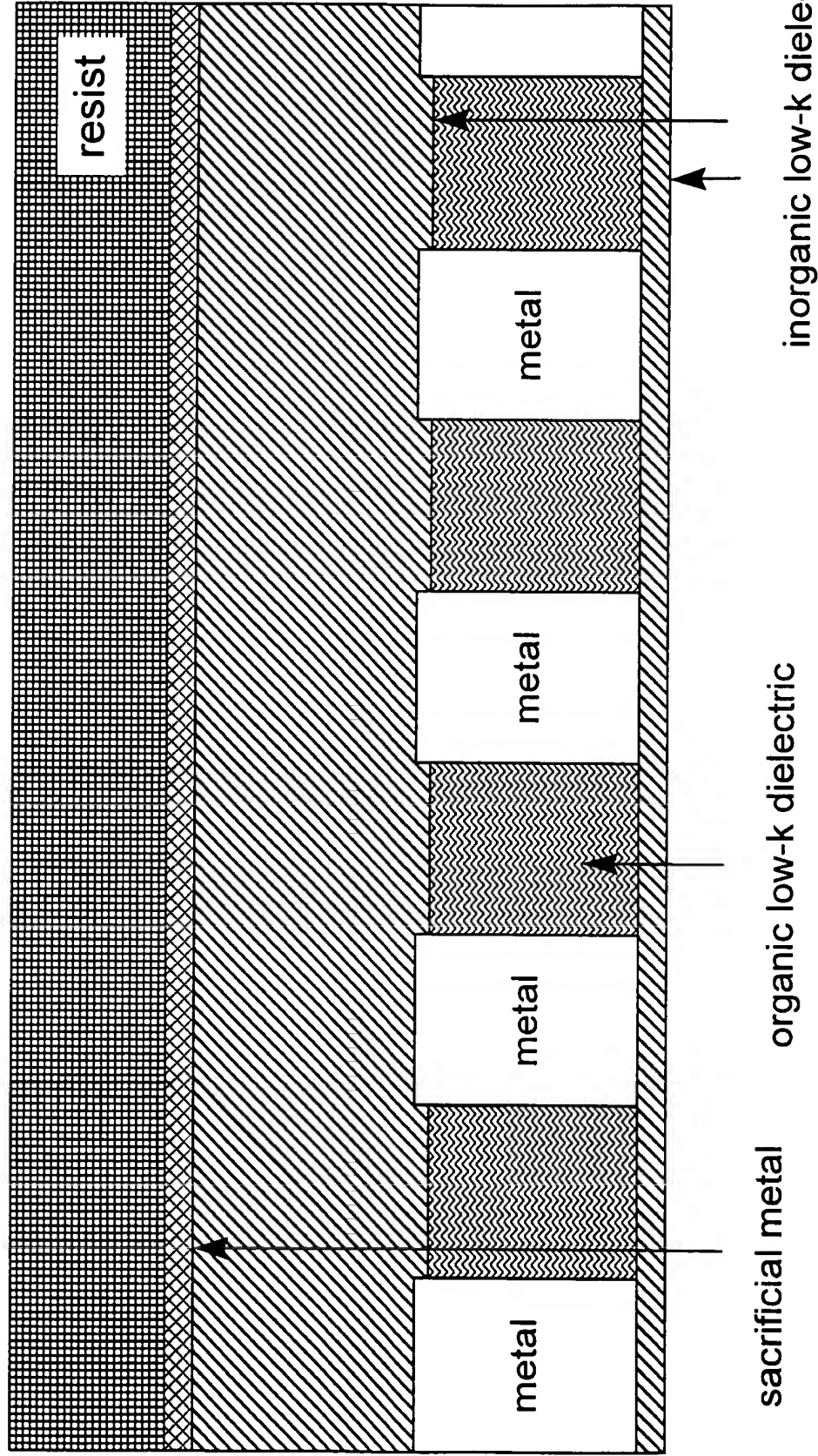


Figure 6B
Step 6: Via mask and resist development

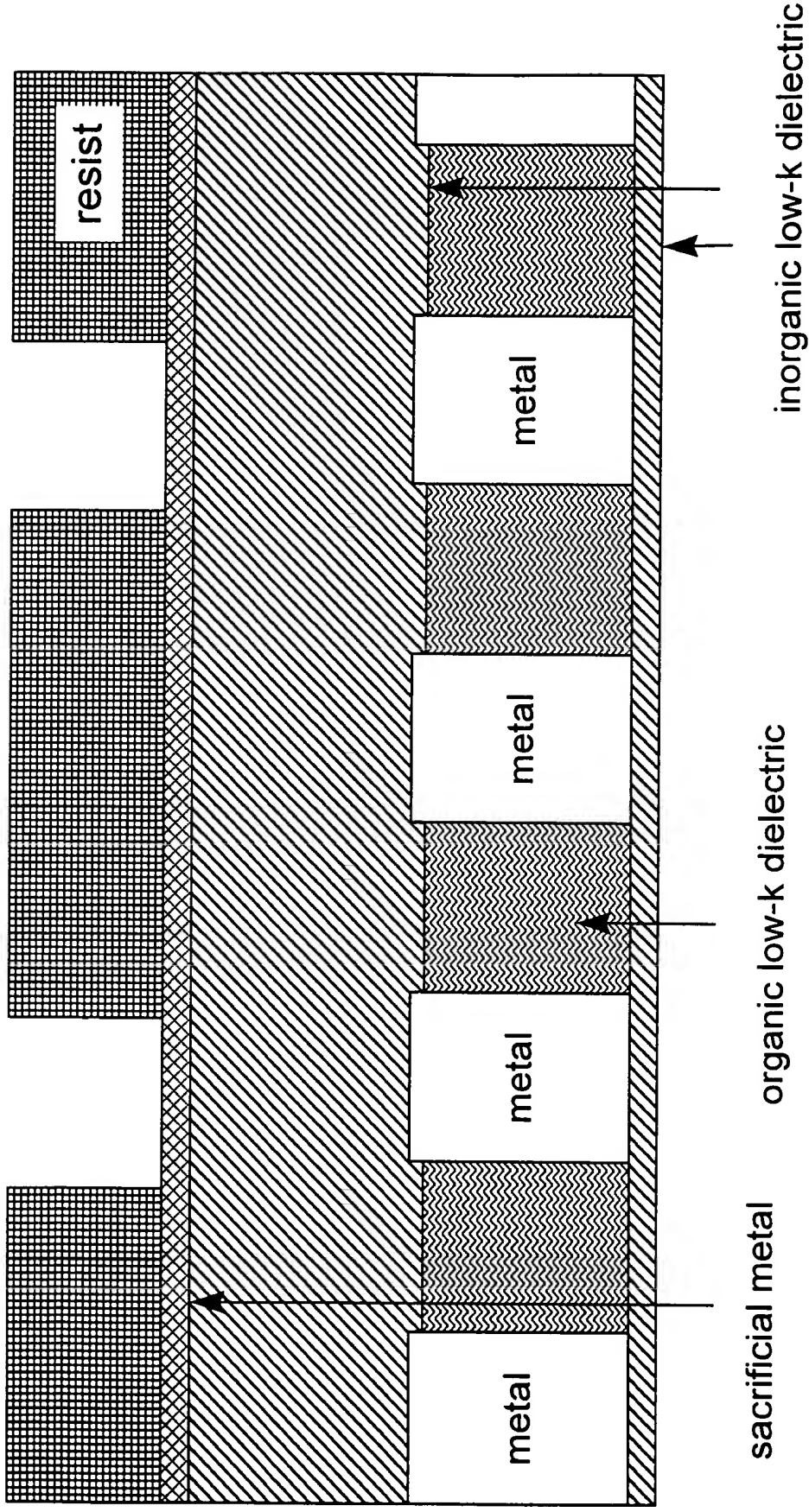


Figure 6C

Step 7: Anisotropic sacrificial metal etch

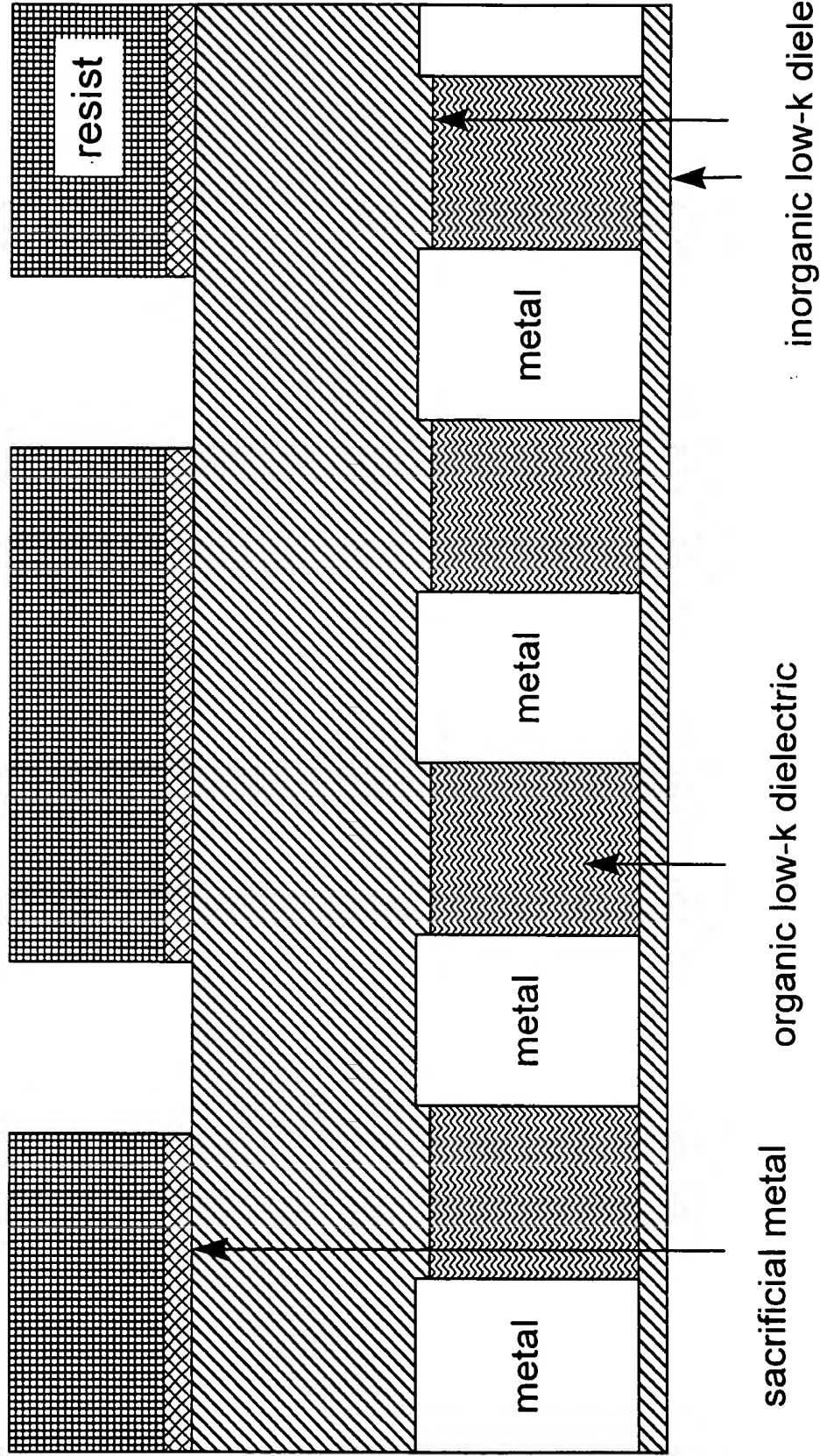


Figure 6E
Step 9: Anisotropic inorganic dielectric etch

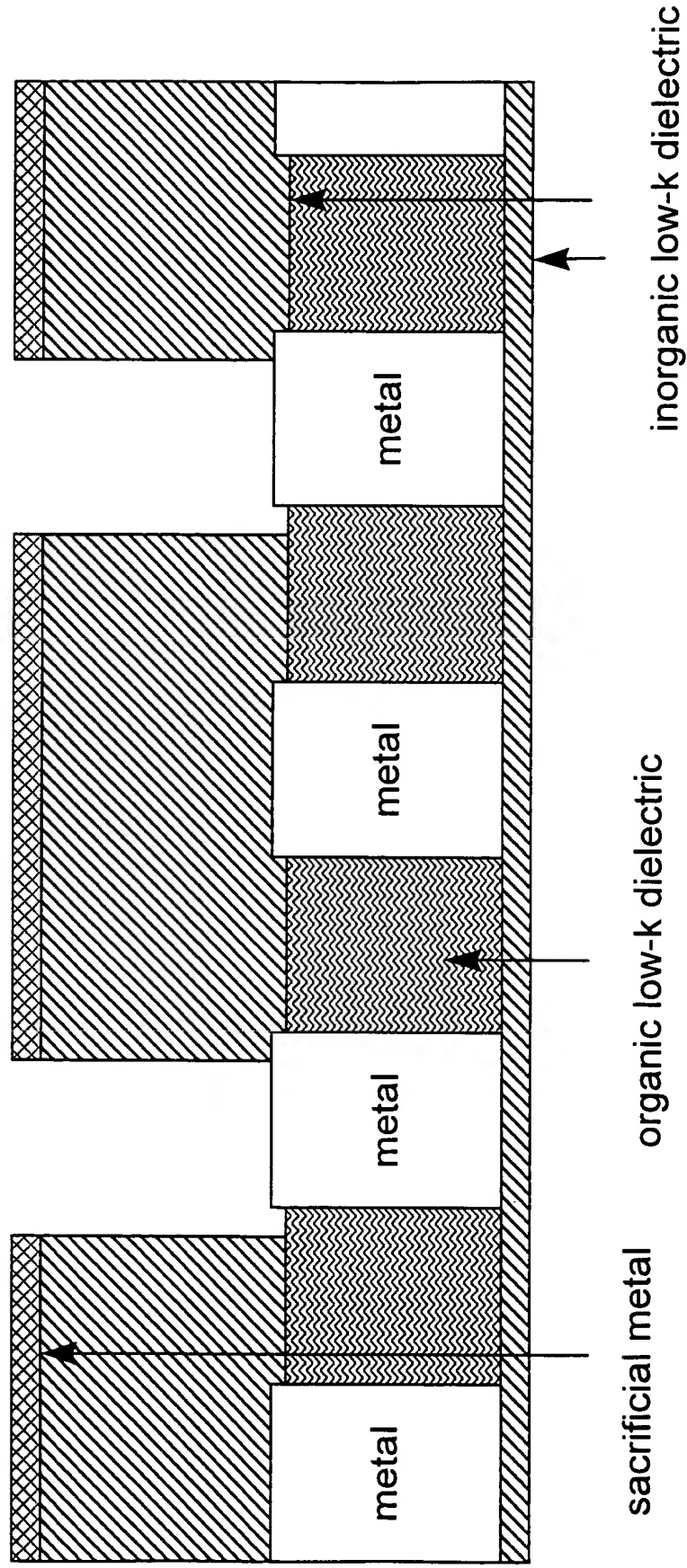


Figure 6F

Step 10: Barrier metal and W depositions

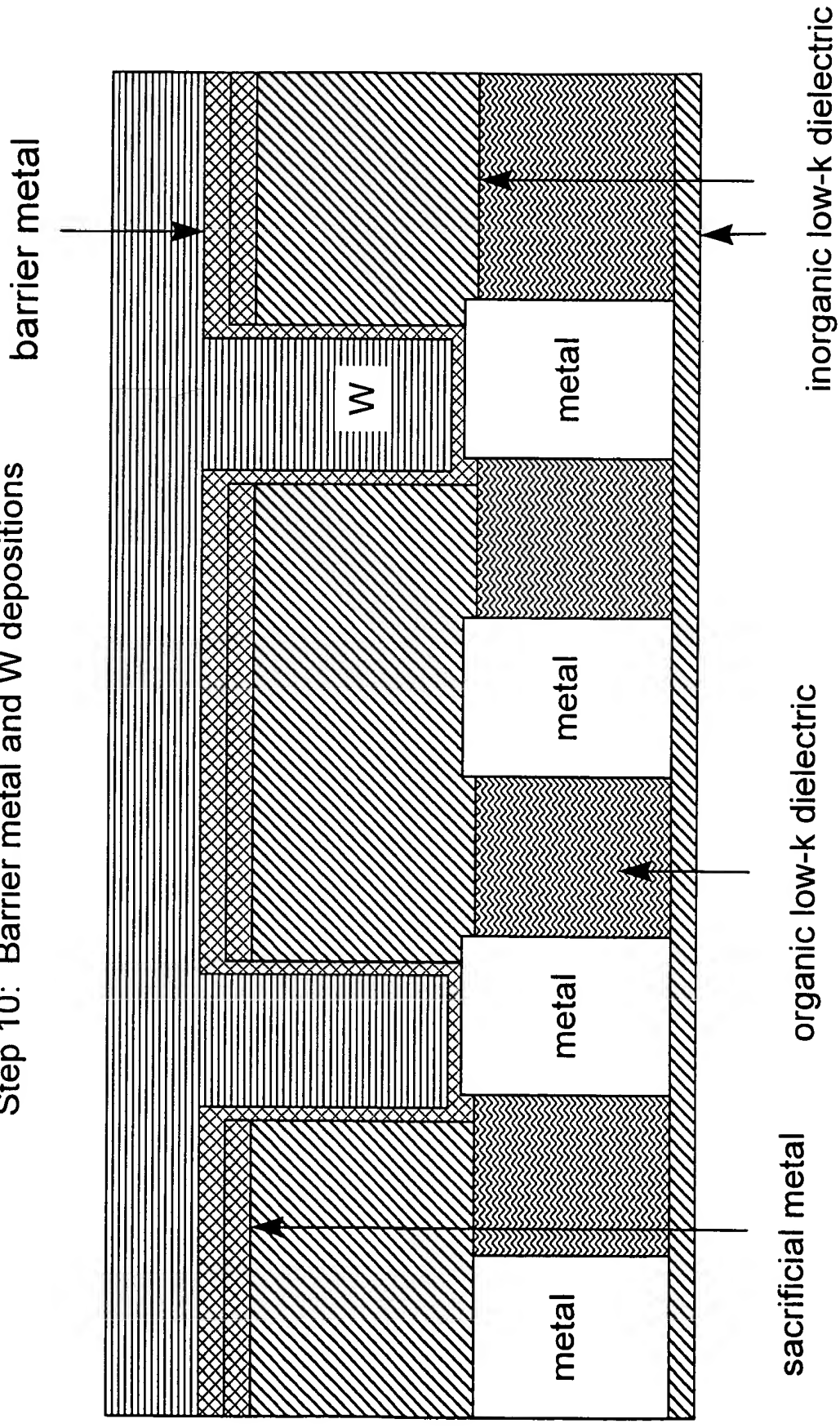


Figure 6G

Step 11: Chemical mechanical polish of W, barrier metal and sacrificial metal

